THE IRON TRADE REVIEW

Volume LIV Cleveland, April 30, 1914 *No. 18*

Pig Iron Market Still Drags

And Finished Materials With Exception of Tin Plate Are Not Active —Possible Results of War With Mexico

The probable effect of a war with Mexico upon the iron trade continues to be discussed. While tin plate manufacturers and makers of other iron and steel products would probably receive some benefits from a prolonged war, it is recalled that in 1898, after the war against Spain was opened, the market sagged and there was no important improvement until the close of the year, after the war had been ended. Whether the tremendous boom of 1899 was due to any considerable extent to the war of the preceding year, is doubtful, and at any rate it was not of the kind to be invited at the present time. Hence, for business as well as for humane reasons, it is hoped that pending negotiations for the restoration of peace in the troubled republic will be successful.

Pig Iron

Makers of pig iron in the eastern territory are greatly interested in the cast iron pipe requirements for two subway tunnels to be built under the East river. The tonnage will come in the time of great need to eastern foundries. New York City is now asking for bids up to May 22 for about 80,000 tons of cast iron segments for the tunnels. Some sales of steel making pig iron have been closed quietly in the east, including from 3,000 to 4,000 tons of Bessemer and 3,000 tons of basic. The Commonwealth Steel Co., St. Louis, is inquiring for 10,000 tons of basic for deliveries extending into the last half of the year. Foundry irons are extremely dull throughout the country.

Structural Material

The awards of structural material in New York City and vicinity show some improvement, as they amounted to 10,000 tons during the week. About 10,000 tons for subway work in New York and 22,000 tons additional for miscellaneous jobs, are pending. In the central west, very few structural contracts have been awarded. The American Bridge Co. has taken 2,300 tons for the Lake street bridge, Chicago. The Pittsburgh market prices of structural material are somewhat stronger than those for plates.

Tin Plate

The one bright spot in mill activities at the present time is found in tin plate, as tin plate manufacturers are operating their plants to capacity. If there should be a protracted war with Mexico, the demand for tin plate would probably exceed the capacity of mills.

Pipe

The action of the National Tube Co. in deciding to close its Benwood plant discloses the limited demand for its products at the present time. The company has announced a reduction of $1 per ton in steel line pipe following a similar reduction in standard steel pipe. Independent manufacturers have adopted the new rate.

Iron Ore

Although navigation on the Great Lakes has been opened for two weeks, there are very few vessels in commission and it is not expected that the ore movement will be heavy prior to June 1. The movement to July 1 last year was about 18,000,000 tons, and it is expected that this year's shipments will be about 8,000,000 tons less than last year. It is estimated that on May 1, there will be about 22,000,000 tons of Lake Superior ore on docks and in furnace yards. While this is a somewhat larger tonnage than is on hand usually at this time of the year, it is the policy of leading companies to maintain a large reserve of ore, and it is believed that the shipments of ore for the season will be between 35,000,000 and 40,000,000 tons.

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Governed By Ignorance

THE report of the secretary of the American Pig Iron Association, read at the meeting in New York last week, was not only a sad corollary of the conditions prevailing in the pig iron industry, but it contained as well a note of warning as to the future.

In the face of the business depression that is in some respects as unique as it is incomprehensible, with pig iron being sold at less than cost in many sections of the country, the fact that there is even a possibility of pig iron coming from abroad because of the removal of the duty is startling, but that some of it has really been landed and that more is under contract to come, and that there exist some rumors of extensive importations of certain grades, is certainly very disquieting.

The tariff was not removed from pig iron because of any pressure from those who consume it, but it was done entirely because of a desire to go to the extreme in placing on the statute books legislation that might be regarded as being of as unfriendly a character as possible to the iron and steel interests of the country, coupled with the dense ignorance of those insisting upon legislation of this character..

It is nothing short of being pathetic to think that a leader of a great political party like Mr. Underwood would make a public statement that pig iron could be produced at a cost of $7 per ton when the Secretary of Commerce and Labor, a member of the cabinet, of his own political faith, in a report to the president of the United States, said that the average cost of all grades north of the Ohio river was $14.16 per ton.

What a calamity to a nation to be governed by such ignorance!

Highly Creditable Work

THE recent annual meeting of the United States Steel Corporation was unique on account of the participation of employes of the Corporation, who shed much light upon conditions affecting labor in Corporation plants. As to whether Mr. Cabot was responsible for the unusual publicity given in the past year or two to matters relating to labor, is not essential. We are willing to say with Judge Gary that we believe that Mr. Cabot was sincere and Judge Gary certainly deserves credit for the attitude which he has taken since Mr. Cabot started to make his criticisms. The point is, however, not what any particular individual has done, but that the public is more fully informed concerning labor conditions and workingmen are better situated than ever before. One very important fact was brought out by Judge Gary in questioning a Canal Dover employe. This employe, E. R. Smith, states that conditions are 100 per cent better than they were in the old days. As to the 12-hour day, Mr. Smith says that it could not be abolished, as the 12-hour men in most cases would leave their work rather than consent to having their hours reduced. It seems to us perfectly plain that, no matter what one may think about the 12-hour day, it must be conceded that the long hours cannot be reduced until the men are willing to sacrifice some of their compensation if they work shorter hours.

The report of expenditures during 1913 for improving conditions among workingmen in United States Steel Corporation plants is indeed impressive. For the relief of men injured and the families of men killed, paid in all cases regardless of legal liability, over $3,000,000 were expended. For sanitation and similar work the expenditure amounted to $1,600,242 and the total expenditure for improving the condition of workmen amounted to $7,240,669. Such generous expenditures have never before been witnessed. On the whole, the Corporation is to be congratulated upon the record which it is making and the generous treatment of its employes and upon its policy of publicity in letting the public know what is being done.

A Practical Plan

LAST week, we spoke of the importance of American manufacturers standing up for themselves and fighting against the unreasonable exactions demanded by politicians and other agitators. A concrete example of how manufacturers can organize is furnished by the plan which has just been announced by the Industrial

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Association of Cleveland. After conferring with more than 400 employes, a plan for organizing business men of the state has been adopted. The state is to be divided into industrial districts with a local organization in each district. The local associations are to be federated in one state-wide association. Then if the state organization expresses itself on legislation or other matters, it will be able to say that it represents organized employers just as the Federation of Labor says that it represents organized labor. In fact, if the employers organize thoroughly, they will represent the employers of the state much more completely than the labor federation represents the workingman.

For years, when legislation has been pending, there has been no concerted effort on the part of business men, and lack of harmony has frequently been apparent. All of this could be avoided and definite constructive work done, if the employers would organize in a practical way. The Cleveland plan is practical and with the proper effort, can be made effective not only in Ohio, but throughout the country.

As a German Sees Us

SOMETIMES a visitor from foreign countries is able to see and understand conditions in the United States more clearly than do the citizens of this country. An interesting article recently appeared in the annual report of the Deutsche Bank of Berlin in regard to the industrial situation in United States, which a reader of THE IRON TRADE REVIEW translates as follows:

"In the United States of America, we find numerous indications of a vigorous recovery of the business which, for several years, has been very bad; but the political and financial troubles in Mexico retard its recovery. Furthermore, the American railway companies require higher rates; the existing freight rates are the lowest in the world; a fraction only of the English rates; although the wages in the United States are more than twice as high as the average paid in Europe. This question is, therefore, one of decisive importance for the whole political economy of the United States, since the possibility of securing the urgently needed new capital, the consequent thriving of important industries and the increased additional opportunities for labor depend on the profit-yielding management of the great railway systems."

The German observer realizes what some Americans are slow to admit in regard to railroad rates in America, as compared with those in foreign countries; likewise the representative of the Berlin bank has correctly sized up the wage situation, concerning which we cannot be too frequently reminded.

Why They Are Roaming About

THE spectacle of a lot of convicted dynamiters roaming about the country as they please after the Supreme Court of the United States has rendered its final decision in their cases has naturally caused astonishment. The question is frequently asked: Why are these structural iron workers not sent to Leavenworth?

The facts briefly are these: When the Supreme Court of the United States refused to entertain a writ of certiorari, it so certified and the case automatically returned to the Circuit Court of Appeals at Chicago. Pending the decision of the Supreme Court, bail continued in force. After the decision of the Supreme Court, the Circuit Court of Appeals could at any time have entered an order remanding the defendants to prison and in the ordinary course of events this order would have been entered at once. Application was made, however, by the attorneys for the iron workers, asking for a delay of 30 days, so that application for pardon could be made. This the court granted. Effort is now being made to have President Wilson instruct the attorney general's department to ask the court for a further stay during the pendency of the pardon proceedings. A number of senators and members of the House of Representatives recently called upon the president with this request. If it is true that hope springs eternal in the human breast and a man can stay out of jail as long as he hopes, there will be little chance of getting these dynamiters into the penitentiary, but we are not willing to believe that the president and the attorney general will consent to an indefinite postponement of the return to Leavenworth. Unless the president should grant a pardon, these convicted men must soon go back to jail.

Prices Present and Past

Quotations on leading products today, average for last month, average for three months ago and average for April, 1913. Prices are those ruling in the largest percentage of sales at the dates named.

	Today's prices.	Average for March, 1914.	Average for Jan., 1914.	Average for April, 1913.
Bessemer pig iron, Pittsburgh..	$14.90	$15.15	$15.00	$17.92
Basic pig iron, Pittsburgh.....	13.90	13.96	13.42	16.77
No. 2 Fdy. pig iron, Pittsburgh	14.15	14.15	13.70	16.71
Northern No. 2 Fdy., Chgo....	14.25	14.25	14.25	17.00
Ferro manganese, Baltimore....	38.00	38.50	36.50	61.75
Lake Superior Charcoal, Chgo.	15.75	15.50	15.50	18.00
Malleable Bessemer, Chicago...	14.25	14.25	14.25	17.15
Southern No. 2, Birmingham...	10.50	10.63	10.50	12.56
Southern Ohio No. 2, Ironton..	13.50	13.25	13.00	15.63
Basic, eastern Pa.....	14.25	14.25	14.00	16.50
No. 2X Virginia furnace.....	12.75	12.75	12.75	15.00
No. 2X Foundry, Philadelphia.	15.00	15.00	14.75	17.50
Bessemer billets, Pbgh. & Ygn.	20.00	21.00	20.00	29.00
Op. h'th billets, Pbgh. & Yn..	20.00	21.00	20.00	29.50
Bess. sheet bars, Pbgh. & Yn.	21.00	22.00	21.00	29.50
Op. h'th sh. bars, Pbgh. & Yn.	21.00	22.00	20.60	30.00
Steel bars, Pittsburgh.....	1.15	1.20	1.20	1.40
Iron bars, Philadelphia.....	1.22½	1.27½	1.27½	1.67½
Steel bars, Chgo.....	1.33	1.43	1.43	1.58
Tank plates, Chgo.....	1.30	1.38	1.38	1.68

	Today's prices.	Average for March, 1914.	Average for Jan., 1914.	Average for April, 1913.
Structural shapes, Chgo.....	1.33	1.43	1.38	1.68
Iron bars, Cleveland.....	1.20	1.25	1.30	1.65
Iron bars, Chgo. mill.....	1.12½	1.17½	1.20	1.57½
Beams, Pittsburgh	1.15	1.20	1.20	1.45
Beams, Philadelphia	1.30	1.35	1.35	1.75
Tank plates, Pittsburgh.....	1.15	1.20	1.15	1.45
Tank plates, Philadelphia.....	1.30	1.35	1.35	1.65
Sheets, blk., No. 28, Pittsburgh	1.90	1.95	1.86	2.35
Sheets, blue ann., No. 10, Pitts.	1.40	1.40	1.37	1.75
Sheets, galv., No. 28, Pitts....	2.90	2.95	2.86	3.50
Wire nails, Pittsburgh.....	1.60	1.60	1.55	1.76
Connellsville fur. coke, contr...	2.00	2.00	1.85	2.50
Connellsville fdy. coke contr...	2.50	2.00	2.50	3.19
Heavy melting steel, Pittsburgh	12.00	12.25	11.05	14.44
Heavy melting steel, eastern Pa.	11.00	11.00	10.50	13.75
Heavy melting steel, Chgo....	10.00	10.25	9.70	12.50
Heavy cast, eastern Pa.....	13.00	13.00	12.50	13.25
No. 1 wrought, eastern Pa.....	13.00	14.50	13.50	16.00
No. 1 wrought, Chgo.....	8.50	9.50	9.18	12.25
Rerolling rails, Chgo.....	11.25	11.75	11.50	14.50
Car wheels, Chgo.....	11.50	12.25	11.75	17.00

(For Additional Prices See Page 816.)

St. Louis Basic Inquiry

And Few Sales of Steel Making Iron in East Are Principal Features of a Dull Market

The Commonwealth Steel Co., St. Louis, is inquiring for 10,000 tons of basic iron, delivery to extend into the last half, but dealers here do not expect this business to be closed for some time. The Nordyke & Marmon Co., Indianapolis, has not closed for 200 tons of northern and 200 tons of southern foundry iron, for which it has been in the market for several weeks.

The market is extremely quiet and sales are mostly for carload lots. Melters do not appear interested in buying at present prices and producers have not shown any inclination to quote lower in either southern Ohio or the south, although the latter market is a little weaker proportionately than the former. A lot of about 500 tons of southern Ohio resale iron has been sold at $13.25, Ironton basis, for No. 2 foundry for second quarter. Furnaces are holding firmly at $13.50, Ironton, for this grade, and are refusing all business at lower figures. It is reported that no more resale iron is available at $13.25, Ironton, but this kind of iron has grown uncertain.

Southern prices are from $10.50 to $10.75, Birmingham basis, for No. 2 foundry, including both Alabama and Tennessee makes. No southern resale iron has made its appearance recently.

Pig Iron Dull at Chicago

Absence of inquiry and few scattering sales continue to mark the pig iron business in Chicago. Dullness such as has not been seen by the oldest observers has seized the business and no spots of improvement are apparent. With plants running at 50 per cent capacity, makers are having no difficulty in filling their obligations to melters and requests to delay shipment continue to be frequent.

Under these conditions, no change has taken place in prices and No. 2 foundry and malleable Bessemer continue quotable at $14.25, Chicago furnace.

So little demand is apparent for southern iron that the prices are purely nominal at $10.50 to $11, Birmingham, no new business being taken except occasional carload orders for immediate use.

More Inquiry at St. Louis

Prospects for business have considerably improved in the St. Louis market by the inquiry put out last week for 10,000 tons of northern basic pig iron for a local steel foundry, delivery to be made over the next five months. It is not believed that the purchase will be made until after the middle of the week.

The inquiry for 500 tons of charcoal car wheel iron, which made its appearance last week, also is still out. Southern No. 2 is nominally quoted at $10.75, Birmingham basis. Northern prices are unchanged.

At Cleveland the dullness of past weeks has continued, and, if that could be possible, has been more pronounced during the past few days. The most satisfactory feature in present conditions is the continuation of shipments at a fairly satisfactory rate. Foundries are operating at an average of 60 per cent capacity.

Valley Pig Iron Dull

Nothing has happened to break the monotony of the pig iron market in the valley district. No inquiries of importance are before the trade and no sales have been made in the open market. Prices, untested, remain the same. Melters of steel-making grades are asking suspensions in shipments more frequently, and blast furnaces are not being pushed. Reports read by officers of the American Pig Iron Association last week at New York clearly indicate why furnacemen are not attempting to sell. Two National Tube Co. furnaces, one at McKeesport and one at Lorain, are scheduled to go out of blast this week.

Inquiry at Buffalo Better

Furnaces in the Buffalo district report a slight improvement in inquiry, over the trading of recent weeks. Producers are inclined to believe that a number of the buyers have reached the point where they find that it is necessary to

(*For Complete Prices see page* 816)

provide for their future requirements. The sales of the week, including all grades, amounted to about 2,000 tons.

The offices of the stacks in this territory report a fair amount of iron going forward under contract, although one producing interest says that specifications have slackened slightly.

Prices remain the same for deliveries up to July 1. The schedules are being held at the quotations which have prevailed for a number of weeks.

Sales of Steel-Making Iron

Some sales of steel-making iron have been closed quietly. One buyer in this district took 3,000 to 4,000 tons of Bessemer at a reported price of about $17.25, delivered, and another leading eastern Pennsylvania consumer closed for 3,000 tons of second quarter basic. The price is not given, but is believed to be about the market, or $14.25, delivered. Eastern Pennsylvania makers were the sellers in these cases. The furnaces invariably report shipments are going forward uninterruptedly. A Wilmington, Del., ship yard has purchased 750 tons of No. 2 plain Virginia and 750 tons of eastern Pennsylvania No. 2X for prompt shipment. The Virginia grade is reported to have gone at $12.50, furnace. A Trenton buyer who recently was in the market for 1,000 tons of malleable, has closed with lake makers. A Burnham, Pa., steel maker recently closed for 2,000 to 3,000 tons of No. 2X with nearby makers. Sales of charcoal iron aggregating 1,000 tons were made in the week. One additional lot of 300 tons of Wabana, Newfoundland, iron has been sold in this territory to fill out a cargo now loading, but there is no disposition shown to push actively this iron at present. The sellers are asking $15 or more, Philadelphia, for this iron which, because of its grade, makes it non-competitive. The Standard Cast Iron Pipe & Foundry Co. is inquiring for 3,000 tons of forge and No. 3 grades for May-June shipment. Other pipe makers are expected in the market soon and directors of the largest maker will consider iron purchases this week. Standard eastern Pennsylvania No. 2X is quoted at $15 to $15.50, Philadelphia, but other brands are available at 25 cents less. Leading Virginia makers hold for $12.75, furnace, for No. 2X, but reports of $12.50 persist. Steel-making grades are inactive. One small lot of basic has been closed at $14.25, delivered eastern Pennsylvania. Large buyers of basic who recently sounded the market are holding off. Only small sales of low phosphorus are reported.

Foreign Buyers Ask Iron

Unfavorable sentiments expressed by makers in attendance upon the meeting of the American Pig Iron Association in New York City the past week, find echo in the utterances of the general trade in the metropolitan district. The market there remains stagnant. Export inquiries, aggregating 5,000 to 10,000 tons, the largest lot of which is 3,000 to 4,000 tons of off low phosphorus for Russia, represent the principal activity. A sale of 500 tons of southern iron for shipment to Genoa, Italy, is noted. Domestic orders and inquiries are extremely few and small. One matter, involving 3,000 tons of mixed grades for a Connecticut buyer, still is pending. The Lackawanna, Erie, and Lehigh Valley railroads, have been buying small lots and the Brooklyn navy yard is distributing 650 tons. Prices, in the main, show little change, but remain largely untested. One sale of eastern Pennsylvania iron was made on the basis of $14.80, tidewater, for No. 2X. Reports of some shading in Buffalo iron are attributed to resale iron, as makers there are firmly holding at $13.50, furnace, for No. 2X.

Sheet Mills Are Hungry

For Orders and Prices Are Very Irregular Throughout the Country

Western Pennsylvania and eastern Ohio manufacturers of steel sheets have watched conditions grow gradually worse this month, and it is difficult to represent the market accurately because of the wide range in quotations reported by sellers and buyers. The more important mills are trying to obtain maximum prices whenever possible, but need of additional tonnages to supply hungry mills has been responsible for decidedly low figures. Black sheets are being fairly well held at 1.90c as a minimum for No. 28 gage, and are relatively stronger than galvanized products, which frequently are going at less than the market minimum. The Allegheny Steel Co. has shut down No. 2 department until May 5.

Low Prices at Cincinnati

The Cincinnati market is quiet and is reported a little weaker from several sources. The general quotations are 1.55c for blue annealed No. 10 gage, 2c for black No. 28 gage and 3c for galvanized No. 28 gage, all Cincinnati basis, but quotations are being made at 1.95c and 2.95c, Cincinnati, respectively, for the latter two. Sales during the past week have been few and for small lots.

Sheets at Chicago Continue Weak

That the sheet market in Chicago is increasingly weak is admitted on all hands and quotations are coming out which shade the prevailing quotations considerably. While 2.03c to 2.08c and 3.03c to 3.08c, Chicago, for No. 28 gage black and galvanized are recognized as the prevailing prices, shading is being done by mills further east and local producers are meeting the cuts to preserve the home market, in many instances.

The sheet market in the Cleveland district is extremely quiet, but concessions are not greater than they have been for a number of weeks; that is, the bottom prices apparently are 1.85c, Pittsburgh, for No. 28 black, 2.85c, Pittsburgh, for No. 28 galvanized, and 1.40c, Pittsburgh, for No. 10 blue annealed.

Shading Sheets in East

On very attractive orders for eastern delivery, the usual market on sheets, 1.40c, Pittsburgh, or 1.55c, Philadelphia, for No. 10 blue annealed, is being shaded $1 a ton. Both eastern and western Pennsylvania makers are doing this price, in cases. The bulk of business, however, is going on the 1.40c, Pittsburgh basis. Tonnage with eastern Pennsylvania makers is running light and order books are well depleted.

Some Shading

Of Ferro Manganese in Resale Material

Some shading of ferro-manganese prices to the level of $37, seaboard, has appeared in eastern territory on resale material. Such concessions are on small lots, which make up the present market. Makers continue to hold firmly for $39, seaboard, on English and $38, seaboard, on German, and are making carload sales at these prices. A Philadelphia steel maker bought a carload of Bessemer ferro-silicon.

Pittsburgh Alloys Quiet

With practically all the ferro-manganese consumers under contract for the year, the Pittsburgh market has been decidedly dull the last couple of months. Dealers complain about lack of activity, and express the fear that shipments will be held up. Other alloys are also dull.

Bids on the viaduct for Columbia Heights, Massillon, O., are being readvertised.

(*For Complete Prices see page* 816)

Reinforcing Steel Bars

Are in Fair Demand—Bar Iron Weak, Especially in Chicago

A fair demand for reinforcing steel bars is current in the Philadelphia and southeastern districts. An inquiry for 3,100 tons of ⅜ to 1¼-inch bars is pending as well as for 460 tons for the Ford building, Atlanta. Another requirement of 300 to 500 tons for a western building is up. An interesting inquiry in view of the Mexican situation is 125 tons of 3 1/16-inch rounds for "automatic turret machines" for the Frankfort arsenal, Philadelphia. The Jones & Laughlin Steel Co. and the Lackawanna Steel Co. divided a small lot of half rounds and angles for Panama, the former quoting 1.425c and the latter 1.4245c, delivered. The Concrete Steel Co. took 530 tons of twisted bars for Panama. Bar makers hold prices at 1.15c, Pittsburgh, or 1.30c, Philadelphia, and this week refused offers of 1.10c and 1.12½c, Pittsburgh, in lots up to 400 tons. Specifications are fair.

New York Specifications Better

Specifications from consumers of steel bars at New York and surrounding territory are a little better as the season opens up. New business is light. Some makers still are quoting 1.36c, New York, or 1.20c, Pittsburgh, on miscellaneous orders, but $1 lower is brought out by the more attractive tonnages.

Bar Steel 1.15c, Pittsburgh

The bar steel market is easily quotable at 1.15c, Pittsburgh, although some mills are able to obtain 1.20c in isolated cases. Demand continues light, and mills are being pressed to reduce prices. Heaviest consumers, including the agricultural implement makers, nut and bolt manufacturers and shafting interests soon will be figuring in the market, and will test prices severely.

Demand for Bars at Buffalo

A number of Buffalo interests and agencies report an improvement in the activity in bars in the past 10 days. The bulk of the specifying being done is for reinforcing bars, corrugated and twisted, going into building operations at Buffalo and places in the vicinity of this market.

Bars for Brake Beams

With the exception of one order for 2,500 tons of steel bars and angles recently placed by a brake beam company and 2,100 tons of reinforcing bars involved in the building of the filtration plant for the city of Cleveland, no tonnages of consequence have figured in the Cleveland market. The minimum price is 1.15c, Pittsburgh.

Steel Bars Dull at Chicago

Soft steel bars in this territory remain stationary and listless at 1.33c to 1.38c, Chicago, tonnages being small and a lack of orders giving mills no little uneasiness. Hard steel bars are unchanged at 1.25c to 1.30c.

Iron Bars Weak at Chicago

No essential change has taken place in the iron bar market in the past few days, the prices remaining weak with a minimum of 1.12½c, Chicago, and comparatively little business moving. This quotation is by no means firm, but no conclusive evidence is obtainable that sales are made at a lower market. Specifications against existing contracts continue to come in from a wide territory for small tonnages, but the market lacks life and some larger users are not in the market for usual requirements.

Bar Iron Nominal at Pittsburgh

The bar iron quotation at Pittsburgh is nominal. Outside manufacturers have offered to lay down material in that district at less than prices offered by nearby mills.

Eastern Bar Iron Weak

Eastern Pennsylvania bar iron makers continue to book lightly and operations are irregular. Prices are weak and 1.20c, Philadelphia, is reported to be available.

Billets Drop

On Small Sales in the Pittsburgh District

Small sales of billets the last few days indicate that the market is quotable at $20, mill, although some manufacturers are refusing to shade $21, mill, the previous quotation. Sheet bars are selling at $21, mill, and reports of that figure being shaded in isolated cases are heard. Forging billets are not commanding above $25, Pittsburgh. Specifications for wire rods for Canadian shipment have been more liberal the last few weeks, as previously explained.

Richmond Consumer Buys Steel

A Richmond, Va., buyer who has been inquiring for 1,500 to 2,000 tons of 2-inch billets has distributed this order. Eastern buyers have been endeavoring to shade $21, Pittsburgh, or $23.40, Philadelphia, on rolling billets with eastern Pennsylvania makers, but the latter have resisted these efforts on the orders offered. New tonnage being booked by these makers is limited.

No Change at Ashland

The minimum prices are $21, Ashland, for billets, and $26.50, Ashland, for wire rods. The market is quiet and no new developments have occurred during the past week. Dealers have turned down a little business at prices slightly under those given above.

Cast Iron Pipe

Is Moving Slowly—Some Low Prices Named

A fair tonnage of cast iron pipe remains in the market about New York and in other eastern districts, but keen competition still forces some low prices. Down to $19, foundry, for 6-inch, still appears. John Fox & Co., representatives of the Donaldson Iron Works, is low bidder on 1,153 tons of 30's at $20.60, delivered, and on 425 tons of 6's and 8's at $21.70, delivered, for Yonkers, N. Y. The Donaldson Iron Works also took 450 tons of 4's to 12's for Quincy, Mass., at $22.50, delivered; R. D. Wood & Co., 288 tons of 6 and 80 for Westfield, Mass., at $22, and the United States Cast Iron Pipe & Foundry Co. is low on 620 tons for Framingham, Mass. Contractors have submitted bids on about 1,400 tons for the department of water supply, gas and electricity, at New York.

Chicago Sells Little Pipe

Were it not for the run of carload orders for cast iron pipe in the Chicago market, the business would be almost flat. Municipal and railroad requirements are much less this spring than is usual and comparatively little tonnage is pending. Bids for 2,700 tons were opened at Cincinnati Monday and an award is expected on this within a few days. The Lynchburg Foundry Co. has taken 200 tons at Jackson, Mich. Prices remain unchanged. Pipe foundries are operating at slightly over 50 per cent capacity.

Hoops and Bands Mark Time

Hoops and bands in the Pittsburgh district continue to mark time, with minimum quotations representing the figures at which the bulk of the tonnage for prompt delivery is being obtained. Cold rolled shafting, following weakness displayed by steel bars, has sold as low as 66 per cent off list.

(*For Complete Prices see page* 816)

Chicago Scrap Stronger

Due to Brokers' Covering—Dullness Continues in Other Centers

Slight indications of greater strength in scrap in the Chicago district are evident. It is not brought about by increasing demand from consumers, but is partially due to brokers covering previous short sales and the fact that machine shops and other producers of scrap are operating at a much lower rate and the supply thus is restricted.

About 14,000 tons of railroad scrap is before purchasers, as follows: Santa Fe, 3,300 tons, including 1,000 tons of No. 1 railroad wrought; Grand Trunk, 100 tons; Chicago & Alton, 250 tons of long rails; Baltimore & Ohio, 10,000 tons, including 800 tons each of No. 1 and No. 2 railroad wrought, 1,000 tons of car wheels, 300 tons steel axles and 2,000 tons of long rails.

The unusual tonnage offered by railroads is claimed by some scrap dealers to be misleading, in that some tonnage not sold when offered is presented a second time and sometimes a third time, thus apparently offering much more scrap than actually has been available.

The scrap iron market in the St. Louis territory is a dead one, with no lists out this week and no change in prices. The M., K. & T. railroad closed a list last week for 2,500 tons.

Unabated Dullness

The dullness which has marked the scrap market during the past month or six weeks at Cleveland is unabated. Rolling mills are neither buying nor taking in scrap, with the exception of the Lake Erie Iron Co., which has taken on a few odd lots. The Upson Nut Co. still refuses shipments of heavy steel and may not lift the embargo for another several weeks. This has caused exceptional pressure on the steel scrap market. Owing to lack of transactions, prices are unchanged. Except for routine work on old orders, brokers find business as near stagnation as it has been in many years.

Weak at Cincinnati

The Cincinnati market has reached a stage where prices are very uncertain because of the long period of dullness and the lack of transactions. Dealers report that they did very little business during the past week, and that the majority of their sales were to melters outside of this city. Local foundries are buying in very limited lots and near-by rolling mills have asked that deliveries be withheld. Machine shop turnings and stove plate are the best in demand, but these are both disappointing. Prices are given as unchanged from those of last week.

Pittsburgh Scrap Declines

Lower prices on nearly all grades of iron and steel scrap have come out in the Pittsburgh district this week, and many believe present minimums could be shaded if an attractive tonnage were involved. Some dealers say they find it difficult to buy material at current prices, and equally as difficult to dispose of it. Quotations for some grades still are nominal.

Buffalo Market Flat

The scrap market at Buffalo reflects no changes in prices and no improvement in activity. It is stationary. With the exception of a small amount of trading in borings and turnings, being sold in the valley, the yards are handling little or no tonnage. Unsettled general conditions are attributed as the cause of the prevailing inactivity of the local yards. A further softening in prices on some of the lines is anticipated.

Acting Slowly in East

Both buyers and sellers are backward about committing themselves on scrap lots of any quantity for future delivery in eastern Pennsylvania and the market continues to be set by small transactions. Prices seem reasonably uniform, but show little strength when material is forced on the market. Consumers appear content to take a receptive position. There has been some talk among dealers as to the effect on the market of the Mexican situation, but no early betterment from this or other causes is expected. Some grades are lower this week including rerolling rails, wrought pipe, No. 1 forge and stove plate. One large buyer is offering $10, delivered, for pipe.

The scrap market in the New York district simply seems to be marking time. Brokers are reluctant to sell ahead under prevailing conditions and buyers likewise are not disposed to take on any tonnages, confining their interest to small lots and to those forced on the market. Prices are not stable. Sales of heavy steel at $8.70, delivered New York, are noted. A small lot of mixed Panama scrap brought slightly over $9, New York.

(*For Complete Prices see page* 816)

Coke is Quiet

With Little Change in Prices—Production Decreased

The market for Connellsville coke offers no new developments, although some insight may be obtained the latter part of the week, when it is understood a couple of furnace coke contracts for May shipment will be closed. Leading operators are asking $2, ovens, for forward shipment, but spot fuel is selling at $1.90, ovens, and reports of that figure being shaded are heard. Foundry coke is being offered for second half delivery at $2.75, ovens, but not many sales are being made. The *Connellsville Courier*, for the week ending April 18, says production for the week ending April 18 was 334,655 tons, a decrease of 20,070 tons compared with the week before.

The market is drifting along with transactions at as low an ebb as at any time in its history. Pocahontas prices are a little weaker and are now given at from $1.90 to $2.40, ovens, for furnace coke, and from $2.40 to $2.60, ovens, for foundry coke. New River quotations are unchanged on foundry coke, but 42-hour grades are 25 cents per ton lower than last week, being now from $2.25 to $2.60, ovens. The Wise County market is stronger than those of either the Pocahontas or New River districts, furnace coke from this field being quoted at from $1.90 to $2.10, ovens, and foundry coke at from $2.50 to $3.10, ovens.

The coke market in the Cleveland district is lifeless, neither furnace operators nor foundrymen showing any disposition to contract at the present time.

Only a few carloads of coke were sold last week in the St. Louis market, and there is no inquiry. Connellsville foundry, 72-hour grade, is quoted at $2.65 to $2.75, ovens, while Virginia 72-hour foundry is held at $2.75 to $2.85.

Tin Plate Mills Busy

Effects of prolonged hostilities, if war is declared against Mexico, have been discussed by tin plate manufacturers, who, of course, will benefit if it becomes necessary to maintain a large army and navy many months. Tin mills are busy, and indications are that they will run at capacities through the normal season.

The Atlantic Refining Co. and other exporting subsidiaries of the Standard Oil Co. which, as reported, are in the market for large quantities of tin plate for their foreign trade, still are carrying on these negotiations.

Plate Price Shaded

On Some Sizes—Light Demand in the East

Although one Ohio plate mill making a limited range of sizes has named a price of 1.10c, Pittsburgh, the usual quotation in the Cleveland district is 1.15c, Pittsburgh. Eastern mills find themselves unable to sell in this territory except occasional tonnages of boiler steel sold on the basis of 1.20c, Pittsburgh.

Pittsburgh Plates Held 1.15c

Pittsburgh manufacturers of steel plates are exercising every effort to hold plates at 1.15c, and have been fairly successful thus far. Consumers, on the other hand, are equally determined to break that figure, which already has been shaded in a number of instances by mills in dire need of additional tonnage. The market is not quotable above 1.15c.

Chicago Plates Lifeless

Steel plates are the weakest of the finished steel products in this market and are quotable at 1.30c to 1.35c, Chicago. While some current business is being done at 1.33c, Chicago, tonnages which offer some attractive features easily command the lower quotation. Lack of orders for railroad cars is responsible in some measure for this condition.

Quiet at Cincinnati

The market is very quiet and shows no improvement over that of last week. Transactions are scarce and limited to small lots. Prices are unchanged at 1.45c, Cincinnati.

Eastern Market Running Light

Makers of plates in eastern Pennsylvania continue regularly to quote 1.15c, Pittsburgh, or 1.30c, Philadelphia. What could be done with certain mills on attractive orders for eastern delivery, however, is problematical, as few lots of this kind are offered. Business does not improve and small orders make up the market. The Worth Bros. Co. has taken 560 tons for Panama at 1.349c, delivered. The Baltimore & Ohio railroad has closed for 300 tons. An eastern Pennsylvania fabricator has covered for 2,200 tons for a section of New York City elevated railroad construction.

Plate orders at New York and vicinity are of the small lot character. A considerable tonnage of this product will probably be required for new subway tubes under the East river and in Canal street, bids for which have been asked. On the small orders moving, 1.31c, New York, or 1.15c, Pittsburgh, is commonly quoted. What could be done on large tonnage with nearby mills, is not determined at present.

Starting Slowly

Little Activity Expected on Lakes Before June

Lake trade certainly was never more stagnant than it is at the present time. While navigation has been open for two weeks, few vessels are in commission and even for those cargoes are not obtainable. Grain is being carried from the head of the lakes for a cent, out of which the vessel pays nearly half a cent to unload. While a few cargoes of ore have been shipped, ore shippers have announced that they will not be in need of outside tonnage during May, so that the ore movement will not really get under way until June. The movement of ore to July 1 last year was about 18,000,000 tons. This year's movement will probably fall about 8,000,000 tons short of that figure, but it is the expectation that after July 1 the movement will be good. There has been a great deal of talk of heavy stocks on dock and in furnace yards, but there is some reason to believe that they are not materially beyond normal and that a fair movement of ore, say between 35,000,000 and 40,000,000 tons, will be required to preserve a normal reserve. In that event, vessel owners can look forward to a good summer and fall.

Wabana Ore Arrives

The season's first cargo of Wabana, Newfoundland, iron ore, amounting to 7,000 tons, arrived at Philadelphia this week. This shipment is being made against contracts with eastern Pennsylvania furnaces made a year ago and carried over at the close of the navigation period. As previously reported, orders for about 30,000 tons of this ore were carried over. No new purchases of this ore for delivery this year yet have been made by eastern furnaces, although this material has been offered at 7 cents per unit, f. o. b. cars, Philadelphia. Consumers show no interest at present in this and other ores.

Wire Market Inactive

The wire market throughout the country is decidedly dull, and manufacturers see no signs of improvement in sight. Sales since the initial month of the year have not been heavy enough to test prices, and consumers appear to have enough tonnage under contract to remain out of the market until summer. Specifications are light and irregular.

Frohman Chemical Co., Sandusky, O., plans to erect an 80 x 160-foot steel and concrete addition to its factory, thus doubling its capacity.

Lower Prices

Made by Warehouses in the New York District

Warehouse prices in New York City have been reduced $2 a ton to 1.85c, New York, on plates and shapes and to 1.80c, New York, on steel bars. Bar iron is quoted about 1.75c, New York, out of store, but this price is subject to negotiation. Store business in the metropolis is slow. Seasonable demand is giving the situation some activity, but it is not up to normal at this time.

Underbidding at Cincinnati

At Cincinnati continued underbidding of market prices by smaller dealers has caused a slight reduction in prices on most of the articles carried by local houses. The majority of dealers are holding at higher quotations and are firmly refusing to accept business at lower figures. Steel bars are quoted at from 1.70c to 1.85c, iron bars at from 1.65c to 1.75c, and plates and shapes at from 1.80c to 1.90c.

Strike Interferes With Business

Warehouse prices on iron and steel products in Chicago remain unchanged, but business is unusually dull for this season. In addition to slow conditions in the market in general, a strike among brick makers in this territory has almost stopped construction and contractors are unable to take out their requirements in iron and steel on this account.

Riverside Plant

Will Shut Down This Week—Line Pipe Reduced

The Riverside plant of the National Tube Co., at Benwood, W. Va., will shut down this week for an indefinite period. About 2,500 men will be affected. Other pipe mills in western Pennsylvania and eastern Ohio are not running as fully as they were a month ago.

National Reduces Line Pipe

The National Tube Co., last Friday, sent out cards providing a reduction of $1 a ton in the price of steel line pipe, which followed a similar reduction effecting standard steel pipe announced a week ago. Independent manufacturers have adopted new cards. No other price changes have been made.

Will Enlarge Plant.—The Harlan & Hollingsworth Corporation, Wilmington, Del., has filed plans for extensive enlargements of its shipbuilding plant. Among other improvements, the ways of the company are to be extended to permit the construction of the largest sized vessels.

(*For Complete Prices see page* 816)

Fair Showing in the East

Made by Structural Material—Awards in New York Are Larger

In New York City and vicinity, structural requirements pending make a very respectable showing. Awards in that district in the week were better, aggregating about 10,000 tons. About 8,000 tons of new subway work is up for bids and 22,000 tons additional, upon which general construction tenders are in, awaits awards of the steel. Structural buyers generally seem in no hurry to place contracts under present conditions. Specifications with eastern mills in standard shapes from the metropolitan district have not been so good. The regular price remains 1.31c, New York, or 1.15c, Pittsburgh, but some reports of shading are current.

Shading in Shapes Reported

Reports that lower prices than 1.15c, Pittsburgh, or 1.30c, Philadelphia, on structural shapes are being made in occasional instances by one or two mills continue current in eastern Pennsylvania and seem well-founded, as most makers keenly feel the need of tonnage in standard sections. The Grey mill of the Bethlehem Steel Co., however, is running full and has a good order book. While specifications with eastern Pennsylvania makers, in cases, are slightly better, there is much idle capacity. New business is sluggish.

Shapes Stronger than Plates

The market for structural shapes in the Pittsburgh district has not sagged so badly as that for steel plates. Attractive tonnages of the former are selling at 1.15c, but some material is bringing $1 a ton above that figure, which is not so true with reference to plates. Placing of contracts for fabricated material recently have brought out decidedly low figures.

Buffalo Market Active

Mills and agencies in the Buffalo district report an increasing volume of business in structural steel, owing to the number of local building projects of varying size that have come out and are to be advanced with the arrival of summer. Sellers are endeavoring to hold prices at 1.20c, base, but on favorable tonnages and contracts, it is believed that 1.15c, base, may be obtained. Leading fabricators report they are figuring on more work at this time than they were during the same period of last year.

Tonnage Small at Chicago

Structural lettings the past week have been of small size and, as in the past few weeks, mostly for the far west.

A pending contract for which bids will be opened April 30 is a pier shed for pier No. 2, to be built by the city of Chicago, involving between 7,000 and 8,000 tons. In the present state of the market, it is believed this project will bring out some unusual prices.

Shapes Weak at Chicago

Structural shapes have undergone no change in the past week and while they are quoted at 1.33c to 1.38c, so little business is being taken that it is difficult to determine the exact level. Tonnages for the most part are small and mills are not booking as much as is expected usually at this season of the year.

CONTRACTS AWARDED.

Savings & Commercial Bank building, Stockton, Cal., 400 tons, to Ralston Iron Works, San Francisco.

Kansas City Stock Yards Co., one 383 foot D. T. deck span, required in the construction of the Kaw river bridge, Kansas City, Mo., 379 tons, to the Missouri Valley Bridge & Iron Co., Kansas City.

Duluth, South Shore & Atlantic Ry. Co., viaducts, one at Brimley, Mich., and one at Middle River, Wis., 368 tons, to Frankman Bros., Minneapolis.

Southern Power Co., Charlotte, N. C., 2,000 galvanized towers, 1,500 tons, awarded to Riter-Conley Mfg. Co.

University of Chicago, building for the department of geography and geology, Chicago, 299 tons, to Morava Construction Co., Chicago.

Uneeda Bridge Co., bridge, Austin, Texas, 286 tons, to Hess & Skinner, Dallas, Tex. (Representing Missouri Valley Bridge & Iron Co.)

Aeroscope for the Pacific Aeroscope Co., San Francisco, 250 tons, to Modern Steel Structural Co., Waukesha, Wis.

Bridges for the Washington & Southern railroad, 2,200 tons, awarded Phoenix Iron Works.

N. G. M. Luykx, Port of Spain, Trinidad Islands, galvanized tanks, 500 tons, the Riter-Conley Mfg. Co.

Store building for Rogers, Peet & Co., Forty-second street and Fifth avenue, New York City, 2,800 tons, awarded the Hay Foundry & Iron Works.

Bridge for Oregon & Washington Railroad & Navigation Co., 1,500 tons, awarded American Bridge Co.

Apartment house for Sol Bloom, Fifty-ninth street and Seventh avenue, New York City, 450 tons, awarded Levering & Gerrigues.

Lehigh Navigation & Power Co., Nazareth, Pa., galvanized towers, 100 tons awarded Riter-Conley Mfg. Co.

Loft building at Thirty-eighth street and Fifth avenue, New York, for Goelet Estate, 1,300 tons, awarded Levering & Gerrigues.

Armory for Troop B, Albany, N. Y., 260 tons, awarded Eastern Steel Co.

Beams for sewer work, Webster avenue, the Bronx, New York City, 380 tons, awarded Carnegie Steel Co.

Power house for the Abitibi Power & Paper Co., Iroquois Falls, Ontario, 1,200 tons, awarded the Dominion Bridge Co.

Can factory for Standard Oil Co., Brooklyn, 300 tons, awarded Levering & Gerrigues.

Southern California Edison Co., special and standard towers, 150 tons, shipment to Los Angeles, awarded Riter-Conley Mfg. Co.

Building for Citizens Trust & Deposit Co., Utica, N. Y., awarded Utica Engine & Boiler Works.

General contract, Terminal Railway Elevator, Buffalo, 600 tons shapes, 250 tons corrugated bars and 350 tons twisted bars and flats, awarded to the Monarch Engineering Co., Buffalo.

Illinois Steel Co., Chicago, four hot blast stoves, stack, etc., for furnace plant at Joliet, Ill., 600 tons, awarded Riter-Conley Mfg. Co.

General contract, Poppenberg store and apartment building, Buffalo, 1,100 tons structural, awarded to Metz Bros. Co., Buffalo.

CONTRACTS PENDING.

Barn of Cleveland Railway Co., 1,200 tons, plans ready May 1, Morrow and Cross, Cleveland architects.

American Bridge & Steel Co., low bid on face at Buffalo, rebuilding Chicago street viaduct, 2,700 tons.

Buffalo Structural Steel Co., low bidder, Fraternal Order Eagles club house, Buffalo, 200 tons.

J. W. Clement Co., Buffalo, printing, revising plans new plant, bids soon, 400 tons structural.

Great Lakes Dredge & Dock Co., Buffalo, contract, guide piers, entrance United States ship lock, Black Rock harbor, Buffalo, timber concrete steel, taking 160 tons stay bolts and screw bolts.

Loomis breaker of Delaware, Lackawanna & Western Coal Co., near Wilkesbarre, Pa., 1,000 tons, revised bids being taken.

Connecting loop of subway extensions at Forty-second street, New York City, 450 tons, revised bids asked for May 12.

Section No. 2 of the Broadway-Fourth avenue subway extensions, New York City, 5,020 tons, T. J. Buckley Construction Co., low bidder on general contract.

Section No. 1 of the Broadway-Seventh avenue subway extensions, New York City, 3,380 tons, general contract awarded the Rapid Transit Subway Construction Co.

Canal street subway New York City 4,115 tons of structural steel; bids to be taken May 12; bids also to be taken on steel and cast iron construction.

Tube under East river for New York City subway extensions, 2,570 tons, bids to be taken May 22.

Connecting loop of New York subway extensions at Whitehall street, 615 tons, bids to be taken May 22.

Y. M. C. A. building, East Third street, New York City, 460 tons, bids entered.

Building for National Carbon Co., Long Island City, 700 tons, bids being taken.

Pier shed for Hamburg-American Steamship Co., North river, New York City, 350 tons, bids being taken.

Cortlandt street grammar school, Providence, R. I., 600 tons, bids being taken.

Elks club house, Baltimore, 450 tons, bids being taken.

Store building, Roanoke, Va., for Jefferson Street Co., 450 tons, bids being taken.

Building for American Eveready Works, Long Island City, 700 tons, bids being taken.

Addition to State House, Boston, 600 tons, bids being taken.

Miscellaneous work for Norfolk & Western railroad, about 700 tons, including extension of Roanoke, Va., shops, bridges and inspection

(*For Complete Prices see page* 816)

building in West Virginia, bids being taken.

Bridges for the Pennsylvania railroad, North Philadelphia, 200 tons, bids being taken.

Parochial School for Church of Our Savior, New York City, 200 tons, bids being taken.

Municipal pier shed, city of Chicago, 7,200 tons, bids to be opeued April 30.

Citizens National Bank, Macon, Ga., 600 to 800 tons; bids asked.

Warehouse for Morgan Millwork Co., Baltimore, 300 tons; bids asked.

Guthrie school, Wilkesbarre, Pa., 300 to 400 tons; bids being taken.

Quay construction at Balboa, Panama canal, 1,500 tons; bids to be taken May 12.

Getting Ready for Work

The governing board of the Industrial Association of Cleveland has elected the following executive committee: Messrs. C. O. Bartlett, J. C. Jennings, Chas. F. Kurz, C. O. Bassett, Willard Fuller, W. D. Sayle, H. B. McGrath and H. G. Schaefer. This committee will take up and put into execution the plan of organization as outlined in the resolution adopted at the recent annual meeting, as reported in The Iron Trade Review of April 16.

Decreasing Furnace Activity

Further evidence of decreased blast furnace operations of the United States Steel Corporation first indicated a couple of weeks ago when 1,300 Frick coke ovens discontinued operations, is presented by the banking of the Emma furnace, Cleveland, of the American Steel & Wire Co. It is understood the company will blow out one of its Shoenberger stacks at Pittsburgh this week. The Carnegie Steel Co. early this month blew out three furnaces and two of the National Tube Co.'s stacks are scheduled to go out shortly.

Contract for Filtration Plant

The general contract for the filtration plant for the city of Cleveland was awarded last Saturday to Charles Fath & Co., that city, at $714,675.75. The next lowest bidder was the J. F. Casey Co., Pittsburgh, which bid $869,059.50. On 2,100 tons of reinforcing bars required, the John F. Casey Co., of Pittsburgh, bid 2c; Winston & Co., New York, 1.5c, and the Walsh Construction Co., Davenport, Ia., 1.35c. Three firms submitted these bids on labor and reinforcing material: Charles Fath & Co., 2.3c; MacArthur Bros. Co., Chicago, 3.5c, and the Duquesne Contracting Co., 4.5c. Chas. Fath & Co. on Monday asked to be relieved of the contract, saying that their engineers had made errors in figuring on three large items. The board of control then voted to award the contract to the John F. Casey Co. Action will be taken later in regard to the request of Chas. Fath & Co. that the check for $10,000 which they deposited with the city be returned.

Showing

Made by Finished Materials is Poor—Railroad Policy Puzzling

New York, April 29. (By wire.)—Conditions in finished materials make a monotonous showing in heavy lines. Reports from various companies show practically no contracting and current orders are of the hand to mouth kind. Wire is making a better showing, especially in specifications and tin plate is up to normal. The sheet market shows no forward interest. Tubes are running about the same as in March, which was a fair month for this product.

Rails are very quiet. Sales are small and orders are much below normal for this season. Where companies report good specifications, they are not getting sufficient new orders to replace the outgoing tonnages.

The buying policy of the railroads remains a puzzle to makers.

The Southern Railway Co. has placed 1,000 box cars, four baggage and express and four baggage and mail cars additional with the American Car & Foundry Co., increasing its recent purchase to about 5,000 cars. The Solvay Process Co. has given the same builder 50 coke cars. These are the only developments of the week in the car market, which remains at a low ebb. Some fair inquiries are out, but orders are being released very slowly.

Rails remain inactive. Small orders only are being placed. Makers are running low on orders and the Maryland Steel Co. mill at Sparrows Point, will shut down shortly if there is no change for the better. The Detroit United Railways is inquiring for 1,500 to 2,000 tons of girder rails. A western road has released 7,000 tons on an old contract to the Illinois Steel Co.

Will Require Large Tonnage

New York, April 29. (By wire.)—About 80,000 tons of cast iron segments will be required for two subway tunnels under the East river for which the city asks bids May 22. One tunnel will require 38,000 tons and the other 36,000 and extras will increase the amount 10 per cent.

(*For Complete Prices see page* 816)

METAL MARKETS

New York

April 28.

Copper.—The refined copper market continues to weaken and although a better tone prevailed yesterday, today's developments have served still further to depress the situation. Leading first hands openly quote 14.25c, delivered 30 days, for electrolytic and reports have been put upon the ticker during the day, telling of sales of millions of pounds at this figure and stating that some producers are about to advance to 14.37½c. These reports, however, are not generally credited, it being believed in some quarters that they are but an effort to bolster up the market. In fact, to off-set these, there are reports from consumers of offers to sell at 14.12½c, usual terms. On a wholesale contract basis, the market now may be quoted at 14c to 14.10c. Current business, according to reliable information, appears to be small in the aggregate. Prime casting is quoted at 13.90c, cash; prime lake is held at 14.50c, cash, and in some cases, 14.50c, delivered 30 days, is offered, which figures down to 14.40c to 14.45c, cash.

Tin.—On Monday the London market declined to £154 5s for spot, a new low record for the year. Yesterday there was an advance, but today a partial reaction brought about a close of £157 on spot. These violent fluctuations have caused a halt in prospective buying here. The New York market today may be quoted at 34.50c to 34.60c for spot, and May and 34.70c for June.

Lead.—The leading interest has advanced its New York shipment price to 3.90c, and the outside market also may be quoted at this figure. Business is small in volume.

Spelter.—Spelter has weakened during the week, producers exerting considerable pressure to sell. Today 5c for New York delivery in carload lots is done and it is said that as low as 4.95c, New York, could be done.

Antimony.—The antimony market is dull and prices are unchanged from last week.

Chicago

April 28.

Following declines in primary markets casting copper, spelter and pig tin are lower in this market.

We quote dealers' selling prices f. o. b. Chicago, as follows:

Lake copper, carload lots, 14.50c; casting, 14.00c; smaller lots, ¼c to ¾c higher. Spelter, car lots, 5.00c; lead, desilverized, 3.70c; sheet zinc, $7.00, f. o. b. La Salle, in car lots of 600-pound casks; pig tin, 35.00c; Cookson's antimony, 7½c; other grades, 6c.

Weakness in the lead market has had its effect among white metals in the old metal market and various forms of lead are a fraction lower than last week. Zinc scrap also has declined somewhat, following weakness of spelter.

We quote dealers selling prices f. o. b. Chicago as follows:

Copper wire, crucible shapes, 13.75c; copper bottoms, 12.00c; heavy red brass, 12.50c; heavy yellow brass, 9.25c; No. 1 red brass borings, 11.00c; No. 1 yellow brass borings, 8.25c; brass clippings, 9.50c; lead pipe, 3.60c; zinc scrap, 4.00c; tea lead, 3.50c; No. 1 aluminum, 14.00c; No. 1 pewter, 23.50c; block tin pipe, 32½c; tin foil, 29.00c; linotype dross, 3c; electrotype dross, 3c; stereotype plates, 4.25c; stereotype dross, 3c.

The Standard Box Co., Sandusky, O., in about a month will start the work of putting its plant into modern shape.

Very Little Activity Abroad

England, Germany and Belgium Report Unsatisfactory Conditions in Iron and Steel Products

Birmingham, Eng., April 17.—The holidays and the Yorkshire coal miners' strike have introduced abnormal elements, which make it somewhat difficult to estimate the pig iron market position. It is believed the Yorkshire strike has come to an end, a compromise having been accepted, and if this should prove to be the case, blast furnaces generally will go on full blast and the production of forges and mills, temporarily interrupted, will be resumed. For the time being, the pig iron position is rather stronger, but the reality of this improvement may not stand the test of increased production.

At the Birmingham meeting on Thursday, somewhat higher prices were asked for most brands, but practically no business was done. Stocks continue to grow smaller, now standing at 109,000 tons. Yesterday's selling price at Cleveland was 50s 9d ($12.42), quite a good figure, considering the small turnover. Cleveland makers appear determined to put out furnaces rather than accept reductions.

Scarcely any work in finished iron and steel lines has been done this week, the Easter holiday having been longer than for some years past. Opportunities have been taken to carry out repairs. The iron trade of the "Black Country" district is in a bad way. Some makers declare they have known nothing like it for 40 years. This, of course, takes into account the circumstances of high wages and dear fuel. Selling prices often have been much lower than they are now, but the margin has never been narrower. The reversion of high class iron for such purposes, in substitution for steel has gone on unchecked, even through the depression, but common bar iron is a drug in the market, and it is difficult to maintain prices. A rather better sign is the booking this week of some large tube orders by one of the most extensive firms in the kingdom. They are mostly for export requirements.

Steel Competition Keener

There are signs that competition in steel is becoming keener. A certain northern firm on the Tees river had so far resisted sweeping reductions until this week when it had to quote lower prices for billets. The makers are hoping the arrival of the present most favorable spring weather will stimulate structural demands, and better orders may be coming shortly from the railways. The galvanized sheet trade is substantially unchanged, quotations remaining at about £12 2s 6d ($59.38), although some buyers claim to be contracting at lower figures. The tin plate mills throughout South Wales have nearly all closed down for the week, and it is hoped, with the restriction arrangements, this may improve the position, but so far hardly any difference is manifest. Prices are cut so fine as to leave the barest margin of profit.

Little Business Done

One effect of the American tariff changes has been the placing of some fair orders for cotton-tie hoops in the Midlands, and British makers are increasingly hopeful that they will get a share of the trade. Now that cotton ties are on the free list, British makers are confident of their ability to compete.

German Iron Trade

Berlin, April 15.

Business in coarse sheets remains unsatisfactory in Upper Silesia. The demand from inland works has been to some extent satisfactory, but the orders from abroad, and particularly from the Danube states, are insufficient, as the Upper Silesian works have to contend with Austrian competition. This competition is all the more noticeable, as formerly the Danube states always placed their large orders for coarse sheets and coarse sheet manufacturers (particularly for use in the petroleum industry) in Upper Silesia. A slow improvement in the market conditions for fine sheets is taking place, but, generally speaking, the situation of the Upper Silesian sheet industry is not satisfactory.

Reports from Westphalia state that finished products are quiet and no change is expected in the near future. Basic steel bars there are reported as being no better than $20.44 and the Hoesch Co. is asking only $20.20 net at Dortmund for bars for northern Germany. These are for prompt and in lots of no less than 10 to 20 tons. Export market prices range from $21.42 to $21.90, f. o. b. Antwerp. The export rate for plates is $21.90 and $22.39. Conditions for drawn wire and wire nails are still unfavorable, and at the moment there seems little chance of the large rod mills bringing about their proposed community of interest. Dusseldorf prices are nominal. Basic steel bars are $23.12 to $23.85; hoops, $28.24 to $29.45½, and light sheets, $28.48 to $29.70.

Belgian Iron Trade

Brussels, April 15.

The weakness of the Belgian iron industry has become still more pronounced. According to reports to hand at the end of last week, foreign trade was very weak and export orders were scarce. For several weeks the foreign demand has been shrinking more and more. South America, which in normal times is one of the best markets for Belgian iron, is at present only purchasing absolutely necessary supplies, while the expected large orders for the Balkan states are continually being postponed. Trade with China and Japan is quiet and the English demand has likewise diminished. The East Indies are still buyers, but only moderate prices are being obtained for deliveries at distant dates. German competition, and in some articles French competition also, are being keenly felt. These unfavorable selling conditions have affected export prices adversely. The home market also is not much better, as business is very slack and prices depressed. The pig iron market is comparatively firm, but in half-finished steel products, only small orders have been booked, after keen competition. Trade in girders is still quiet, while in sheets also the situation is depressing and shows no sign of improvement. Business in bars has slackened slightly. Compared with the beginning of the month, the quantity of orders for pig iron is unchanged; as, however, the production has increased since then, there is keener competition for the disposal of tonnage.

Orders for Steel Pipe

Pittsburgh, Pa., April 29.—Orders for seven miles of 12-inch and seven miles of 16-inch steel pipe have been placed in the Pittsburgh district for shipment to Ohio points.

Corporation Has Deficit

Unfavorable Quarterly Report, But Dividend is Declared

A deficit of $6,289,644, after the payment of the regular preferred and common dividends, is shown by the United States Steel Corporation as a result of its operations for the first quarter of 1914, according to the quarterly report issued April 28. This was the most unfavorable quarter the Corporation has experienced since the first quarter of 1912, when the deficit made up from the undivided surplus was $6,292,143. During the quarter just closed the total earnings of the Steel Corporation were $17,994,381. In the first quarter of 1912, they were $17,826,793.

The earnings of the Steel Corporation during the first quarter for the past seven years, have been as follows:

1908	$18,229,005
1909	22,921,268
1910	37,616,876
1911	23,519,203
1912	17,826,973
1913	34,426,801
1914	17,994,381

It is shown that in the quarter just closed the preferred dividend was barely earned. The regular dividend of 1¾ per cent on the preferred stock is payable May 29 to holders of record May 4, and 1¼ per cent on the common on June 29, to holders of record of June 1.

The quarterly report for the period ended March 31, is as follows:

EARNINGS.

	Earnings before interest subsid. bonds.	Interest subsid. bonds.	Balance.
Jan., 1914	$5,760,709	$819,372	$4,941,337
Feb., 1914	6,474,740	819,129	5,655,611
Mar., 1914	8,215,539	818,106	7,397,433
	$20,450,988	$2,456,607	
Total earnings			$17,994,381
Sinking funds sub. bds. and deprec, etc.		$4,285,527	
Sink. funds on U. S. Steel bonds		1,512,496	
			5,798,023
Net income			$12,196,358
Int. U. S. Steel bonds		$5,600,279	
Prem. pay. on bonds		227,023	
			5,827,302
Balance			$6,369,056
Prfd. div.		$6,304,919	
Com., div.		6,353,781	
			12,658,700
Deficit for quarter provided from undivided surplus, Dec. 31, 1913			$6,289,644

A dividend of 1 per cent on the common stock of the Tennessee Coal, Iron & Railroad Co. has been declared, payable May 1. This is the first dividend on the common stock to be declared since the Tennessee company was acquired by the United States Steel Corporation in 1907. Numerous declarations on the preferred stock have been made. All but $225,000 of the $32,530,000 common stock of the Tennessee company is held by the Steel Corporation.

At the meeting of the board of directors of the United States Steel Corporation, at New York, April 28, the first following the annual meeting, President Jas. A. Farrell and other officers were re-elected for the ensuing year.

Some Advances Necessary

Says Brandeis, in C. F. A. Territory, Urges Abolition of Free Service

Washington, April 28.—The carriers this afternoon completed their direct arguments in the 5 per cent case before the Interstate Commerce Commission. The opposing side, with Special Counsel Louis D. Brandeis, has 11 hours allotted for its arguments, then the carriers will make reply and the case be closed so far as the first of the two main questions is concerned and this may or may not mean the end of the entire case. It would, in case the Commission found the present rates, yield adequate revenue. The impression is based only on speculation, of course, but it is the prevailing belief that no general advance will be granted. The arguments will end Friday morning.

Except as to Central Freight Association territory railroads, the eastern railroads have failed absolutely to sustain the justness and reasonableness of advances they have sought, according to the brief prepared by Attorney Brandeis. Great stress is laid by Mr. Brandeis on the fact that the carriers' could secure added revenue, which he concedes may be needed, through elimination of so-called free services. At some length, he takes up the steps which the railroads have employed to make charges for services heretofore rendered free.

Alleged horizontal advances, Mr. Brandeis points out, would intensify existing injustice and discrimination in rates and give additional revenues where relief is not needed and would fail to give adequate revenues to carriers who are most in need of relief.

"The impropriety of raising additional revenues by the proposed tariff," says the brief, "finds striking illustrations in the condition in Central Freight Association territory. There higher rates seem to be required; but relief cannot be had without a readjustment of the rate schedule."

In view of the immense traffic carried in Central Freight Association territory by reason of the iron and steel industry, both through raw materials and finished products, the following statement from Mr. Brandeis' brief is interesting:

"As to some rates, like those on coal, coke and ore, evidence was introduced to show that the present rates were not only remunerative, but also that the cost of moving the traffic had in recent years actually decreased, through the development of heavy car and train loads; these being peculiarly applicable to traffic of this character."

Timely Papers

To be Read at American Iron and Steel Institute

Tentative program for meeting of American Iron and Steel Institute at New York, May 22, is as follows:

Address of the president, Elbert H. Gary.

"Modern American Blast Furnace Practice," Hermann A. Brassert, Illinois Steel Co., So. Chicago, Ill. Discussion, John N. Reese, Republic Iron & Steel Co., Youngstown, O.; Arthur J. Boynton, the National Tube Co., Lorain, O.; Edward B. Cook, Pickands, Mather & Co., Cleveland; Richard V. McKay, Pennsylvania Steel Co., Steelton, Pa.

"Some Developments in By-Product Coke Ovens," William H. Blauvelt, Semet-Solvay Co., Syracuse, N. Y. Discussion, Carl A. Meissner, United States Steel Corporation, New York City.

"Selling Policy as Influenced by Modern Cost Accounting," Thomas J. Bray, Republic Iron & Steel Co., Youngstown, O. Discussion, C. S. Robertson, Youngstown.

"The Practical Importance of Heat Treatments in the Steel Wire Industry," John F. Tinsley, American Steel & Wire Co., Worcester, Mass. Discussion, J. W. Smith, Wyman & Gordon Co., Worcester, Mass.

"Transportation," J. Fred Townsend, National Tube Co., Pittsburgh. Discussion, Delos W. Cooke, Erie Railroad Co., New York City; Thomas O. Cole, Bethlehem Steel Co., South Bethlehem, Pa.

"Recent Progress in the Building of Large Steam Turbines," Francis Hodginson, Westinghouse Machine Co., East Pittsburgh. Discussion, H. G. Stott, Interborough Rapid Transit Co., New York City.

"Sanitation in Panama and Alabama," Dr. Lloyd Noland, Tennessee Coal, Iron and Railroad Co., Birmingham, Ala. Discussion, Dr. Sidney McCurdy, Youngstown Sheet & Tube Co., Youngstown, O.

Impromptu remarks on call of Judge Gary.

Year of Progress is Reviewed

At Worcester Convention of National Metal Trades Association—Hearty Welcome and Elaborate Entertainment—Protest Against Pending Legislature

Extremely interesting progress reports on industrial education, accident prevention and labor legislation, and exceptionally able papers on scientific management, featured the sixteenth annual convention of the National Metal Trades Association, held at the Bancroft hotel, Worcester, April 21 and 22. Reports of the officers showed the organization to be stronger than ever before in its history, and the attendance was record-breaking, proving that Worcester was a wise selection as a convention city. At the opening of the convention on Tuesday, the registration was 212, while at the close the count had swelled to 294. The warm hospitality extended by the local members made it probably the most genuinely enjoyable meeting of the N. M. T. A. in years, and the convention showed its appreciation by thanking the Worcester branch in a formal resolution. A resolution deploring the trend of recent legislation, and protesting especially against the Clayton bill, now in the House of Representatives, was submitted to the convention and adopted unanimously.

Declaring that the convention brought to a close another eminently satisfactory year in the history of the association, President W. A. Layman, in his report at the opening session, Tuesday afternoon, congratulated the members on the manner in which the prestige of the organization has been maintained. Expressing his gratitude to his fellow officers for their hearty co-operation during the year, he paid a well-merited tribute to the work of the new commissioner, John D. Hibbard.

"One of the critical events in the association's history," said President Layman, "was the withdrawal of Robert Wuest, one year ago, from the commissionership. It was felt that the association would suffer keenly the loss of Mr. Wuest, and that its work would lose some of the effectiveness which characterized it while he was in office. In Commissioner Hibbard, however, we have a commissioner who is a worthy successor of Mr. Wuest. Mr. Hibbard has performed the arduous duties of his office in a manner which has left nothing to be desired, and it is therefore a deep pleasure to report that he has qualified very successfully.

"While we are speaking of Mr. Wuest, it may interest you to know that I received a letter from him recently. He reported that he has seen evidences of labor trouble in every foreign city which he has visited. The only spot he struck that was free from such troubles, he said, was an oasis in the Sahara desert."

Treasurer's Report

The report of Treasurer F. C. Caldwell showed the finances of the association to be in a very satisfactory condition, heavy expenses during the year having in no way impaired its funds. Homer D. Sayre, the new secretary, whose efficient work during the year called forth an acknowledgment from from President Layman, submitted a report on the membership and organization of the association. He outlined plans which are to be carried into effect in the near future to enlarge the sphere of usefulness of the association to its members, and declared the removal of the general offices from Cleveland to Chicago has resulted in many advantages.

The New President

Herbert H. Rice, the new president of the National Metal Trades Association, is manager of the Waverly Co., Indianapolis. He is a native of Providence, R. I., where he received his education at Brown university. After leaving college, he worked for a short time in Providence and Hartford and then went west, where he soon became prominent in the automobile world. Like the retiring president, Mr. Rice is a young man, and for several years has taken a prominent part in the work of the N. M. T. A. He is vice president of the Indianapolis branch.

Commissioner Hibbard delivered a report on the field work which has been accomplished by the association during the year. This has been of an extensive and far-reaching character, and has been attended by gratifying results in the upholding of the rights of employers in their relations with their workmen. In successfully carrying on this work, he said, he was aided wherever possible by the various members and by the secretaries of the local branches. Mr. Hibbard especially complimented the work of Frank Cheske in solving labor problems.

Industrial Education

The report of Chairman F. A. Geier, of the committee on industrial education, ranked with the most important of the proceedings of the meeting. Mr. Geier, suggested compulsory vocational training as a cure for many existing ills.

"Of all the means for solving labor troubles," said Mr. Geier, "I believe the general adoption of vocational education would be the best. I believe that by taking the boy in hand, teaching him a trade and instilling good principles in him, we can develop a better workman and a better citizen, and one that will be inclined to treat his employer with fairness. Such a workman would be more progressive and it would be easier to co-operate with him in furthering efficiency, safety and sanitation work; in short, such a workman would be likely to realize that his interests and those of his employer are alike.

"At the present time, there are more than 200 corporations, with a combined capitalization of more than $2,000,000,000, which conduct educational courses for their employes. This effort is good as far as it goes, but it does not go far enough; I doubt whether 1 per cent of the workers in this country are receiving vocational training. The obstacle in the way of the general adoption of vocational training is that such training now is almost entirely voluntary.

"I believe the public schools should adopt means for fitting each pupil for

(*Continued on page* 808.)

Not Anxious

To Have Government Build Armor Plate Plant

Washington, April 28.—During discussion of the naval appropriation in the house last week, Chairman Padgett, of the naval affairs committee, made it plain that he is not ardently desirous of having the government build its own armor plate plant. Threadbare statements, productive of much oratory for home consumption, had broken out when reference was made to the provision in the bill directing the secretary of the navy to investigate and report at the next regular session of congress upon the selection of a suitable site for the erection of an armor plate plant.

It was stated by Chairman Padgett that it had been estimated that it would cost $15,327,000 to build a 20,000-ton plant and a gun-forging plant, while the estimated cost of the former would be $11,288,421. For a 10,000-ton plant, he said, it was estimated that the cost would be $8,466,000 and for a 5,000-ton plant $6,300,000.

Then he turned to the point that the manufacture of armor plate was a hazardous undertaking.

"Take a plate that is 20 feet long and 10 feet wide, the size of one of the armor plates," said Mr. Padgett, "that represents an immense amount of money in the tonnage in the plate at any price. The spoiling of that plate represents a large loss. The government in experimenting with this thing, in educating and training its men, might lose a very large sum of money; that would add to the cost of the material that was manufactured in perfection."

Replying to Representative Buchanan, of Illinois, Mr. Padgett said the government could employ experts, but that his information was that some of the experts in the manufacture of armor plate are paid at the rate of $10,000, $15,000 or $20,000 a year.

"The government does not pay salaries of that kind," Mr. Padgett said.

Disclaiming that he wanted to be put in the position as opposing a government-owned plant, he pointed out that the committee had instituted a proceeding to get the necessary information for intelligent action. He told Representative Levy that he understood that all foreign governments, except one, pay more than the United States does for armor plate. He conceded also, in reply to a suggestion by Representative Browning, that armor making companies had entered into the business at the request of the government.

Reading from testimony given before the committee recently by Admiral Strauss he told Representative Witherspoon, of Mississippi, that he was in error in his statement that Secretary Daniels had said armor could be made for $179 per ton. Admiral Strauss' testimony, he said, estimated that in a plant with a 20,000-ton capacity the cost would be $279 a ton; manufacturing 10,000 tons a year, the estimated cost would be $349 per ton, and manufacturing 5,000 tons a year the cost would be $400 a ton. Figures were also submitted showing cost of manufacture for plants of smaller capacity would be relatively higher. Mr. Padgett said these estimates were largely made without "that acute investigation that should be made to authorize the government to go into an expenditure of a great many million dollars in a class of manufacture that is hazardous."

Spotting Tariffs

Are Filed and Spotting Service is Defined

Washington, April 28.—Reports of the latter part of last week that the carriers were preparing to file spotting tariffs were verified late this afternoon, when the tariffs, in large numbers, and representing railroads throughout official classification territory, were opened at the Interstate Commerce Commission offices and work of filing them begun. The tariffs propose a charge of 5½c per ton, either gross or net, with a minimum of $2 per car, and are filed to become effective May 27.

It is evident that the railroads agreed upon a uniform spotting tariff, all of them providing the same charges and the same rules and regulations. In a note accompanying the tariffs, it is pointed out that they have been filed in conformity with the decision of the commission in the Industrial Railways case, which affected steel plant roads east of the Mississippi river. Further, it is stated that the tariffs "should be regarded in a measure as tentative and subject to such increase or decrease as may be required by the commission".

While not all of the tariffs have yet been opened, all of those of the big systems, have appeared, including the Baltimore & Ohio, the Pennsylvania, the New York Central, the Big Four, the Lehigh Valley, the Pittsburgh & Lake Erie, the Lake Shore. Others, such as the Wheeling & Lake Erie, the Central Railroad of New Jersey, and the Philadelphia & Reading, have also appeared.

After describing what constitutes spotting the names of the industrial plant tracks and the industries on them are listed. Included among these, of course, are many steel plant lines.

Foreign Trade

Will Be Discussed at Convention in Washington

Washington, April 28.—The relationship of the Underwood-Simmons tariff and the federal reserve acts to foreign trade will be given special attention through papers and discussion at the first national foreign trade convention to be held at the Raleigh hotel in this city on May 27 and 28. Among those included in the general committee making arrangements for the convention are:

President James A. Farrell, United States Steel Corporation; President E. A. S. Clarke, Lackawanna Steel Co.; President Eugene P. Thomas, United Steel Products Co.; President Alba B. Johnson, Baldwin Locomotive Co., and President Waldo H. Marshall, American Locomotive Co.

Responses have been made by manufacturers, transportation interests and commercial bodies throughout the country to the invitation to attend and participate in the convention, representing eminent exporters. It is taken to indicate an extremely lively interest in foreign trade through appreciation that a large export trade will stabilize industry and help manufacturers to continue a large output even when the domestic market is dull. The union for the purpose of holding this convention of the American Manufacturers' Export Association, the Asiatic Society and the Pan-American Society brings to its support practically all branches of American foreign trade.

An invitation will be extended to President Wilson to make an address, as the convention is in a sense a response to his statement that the object of the new tariff is "whetting of American wits by contest with the wits of the world."

Would Prevent Unemployment

Washington, April 28.—The first testimony bearing on proposals of the United States Commission on Industrial Relations for a national bureau of labor exchange in connection with the Department of Labor will be heard in New York during the week beginning May 4. The hearings will be continued in other large centers. The plan is for national legislation to wipe out unsettled conditions in the country's labor market and to prevent unemployment.

Witnesses will be heard to give their views on the plans, which are tentative. The central office would be

in Washington and branch offices would be established in other cities, with a clearing house for each of several districts into which the country would be divided. The bureau would have the power to establish and conduct free public employment offices. Data as to conditions in the labor market would be gathered and published to help both the employe seeking work and the employer needing workmen.

Ore Rate Cases

Will Be Heard by Interstate Commerce Commission Next Month

Pittsburgh, April 29. — The next chapter in the western Pennsylvania-Ohio-West Virginia iron ore freight rate controversy will be written at Washington within the next two or three weeks. Hearing of complaints of the Pittsburgh Steel Co., Pittsburgh, and the Wheeling Steel & Iron Co., Wheeling, W. Va., against the present 88 cent rate on Lake Superior iron ore from lower Lake Erie ports to the Pittsburgh-Wheeling district, was set for April 24. Immediately after the hearing opened, Attorney Wade H. Ellis, representing complainants, asked Special Examiner Myron A. Pattison to grant a motion for adjournment. No exceptions to the motion were made; and it was allowed after the examiner had communicated with the Interstate Commerce Commission, before which both cases will be heard at Washington early in May.

Complaints will be heard in connection with a general investigation into the iron ore freight rate situation in western Pennsylvania, West Virginia and Ohio, which is of considerable importance to the iron and steel industry. Complaints were filed shortly after railroads adopted the 88 cent freight rate to the Pittsburgh and Wheeling districts, reducing that to the former 8 cents and increasing the latter 28 cents a ton.

Representatives of industrial and railroad interests in the Pittsburgh, Johnstown, Wheeling, Youngstown, Ironton and Ashland districts were at the brief session here.

Protest Coke Rate

Washington, April 28.—The Alan Wood Iron & Steel Co., the Empire Steel & Iron Co., the E. & G. Brooke Iron Co., and Worth Bros. Co., through Attorneys Robert D. Jenks and William A. Glasgow Jr., have filed with the Interstate Commerce Commission a joint brief protesting against proposed increases by eastern railroads on coke from the Connellsville, Latrobe and Mountain regions of Pennsylvania and the Fairmont region of West Virginia to stacks in the Schuylkill and Lehigh valleys of eastern Pennsylvania.

Order for Natural Gas Engine

The Mesta Machine Co., Pittsburgh, has received an order for a 28 x 36-inch twin tandem horizontal double acting natural gas engine to be direct connected to a 1,250-kilowatt alternating current generator to run at 120 revolutions per minute. The engine was ordered by the Sistersville Electric Light & Power Co., Sistersville, W. Va., and is similar in design, although of larger size, to two other Mesta engines installed in the Sistersville plant in 1911. These two engines have been running continually at 200 revolutions per minute, furnishing power for lighting and operating railways at Sistersville.

The Mesta Machine Co., Pittsburgh, is erecting a 26 x 48-inch simple Corliss steam engine of the heavy duty rolling mill type for the Whitaker-Glessner Co., Wheeling, W. Va. The engine will be shipped within a few days.

Death of George F. Baer

Geo. F. Baer, a commanding figure of eastern railroad and industrial circles, died at Philadelphia from a sudden gastric attack. He was overcome by illness on the street the day previously and remained unconscious until the end. He was 72 years of age.

Mr. Baer was president of the Philadelphia & Reading railroad and was the guiding personality in the large coal and other industrial interests of that system. He also was president of the Central Railroad of New Jersey and was a director of the Reading Iron Co., Pennsylvania Steel Co., Cambria Steel Co., Cambria Iron Co., Allentown Iron Co. and other companies. He occupied a leading position in the administration of the affairs of the Reading Iron Co.

Mr. Baer was born in Loransville, Pa., and was educated at Franklin and Marshall College. Early in life he engaged in the printing and newspaper trade, but after the Civil War, in which he was a Union soldier, he took up the practice of law. It was his skill and ability as a lawyer and counsellor especially on business matters, that gained for him finally his high position in the railroad and industrial world. He was known for his unyielding firmness after forming a decision and for his industrious and constant habits of work, which continued up to the day of his death. His residence was at Reading.

An incident with an iron and steel flavor, illustrating Mr. Baer's sense of humor and his firmness after his mind was made up, is related by close acquaintances. A leading eastern steel maker had sought out Mr. Baer and had urged that the freight rates to and from his plant be reduced. Failing in the end to convince the railroad executive that the ruling rates were not fair and equitable, the steel maker had exclaimed with rising heat:

"Do you know, Mr. Baer, what Andrew Carnegie did when the Pennsylvania railroad refused to give him the rates to which he believed he was entitled? He went and built his own road."

"Yes," said Mr. Baer with a quiet smile, "but he never was up against a Pennsylvania Dutchman."

Obituaries

Albert E. Reed, secretary-treasurer of the Pittsburgh Brakeshoe Co. and the Vanport Brick Co., died at his home in Pittsburgh last week. He was born Nov. 5, 1879, at Tunbridge Wells, Kent, England, and came to this country in 1892, entering the employ of the Dunn Mfg. Co., Pittsburgh.

Ezra Marvin, for many years the president of the Marvin Safe Co., New York City, died suddenly April 24 at Bethlehem, Pa., while upon a visit. He retired as president of the company 15 years ago, and the firm became the Herring, Hall & Marvin Safe Co., with which he remained in an official capacity.

Harry Rush Gilbert, 69 years old, manager of the Continental works of the National Tube Co., Pittsburgh, died April 26 at his home in that city. He had been manager of the National plant 13 years. Mr. Gilbert was born at Girard, O., Nov. 27, 1845. He was a veteran of the Civil War, serving in the 171st Ohio Volunteer Infantry. His widow survives.

Charles Bailey, head of the Reliance Steel Casting Co., Pittsburgh, and one of the veteran steel casting manufacturers in western Pennsylvania, died April 20 at his home in Pittsburgh. He was born Aug. 22, 1854, at Pittsburgh. For a number of years he was employed by the Pittsburgh Steel Casting Co. In 1899, Mr. Bailey and Joseph A. Kelly, organized the Reliance Steel Casting Co., with which he was identified the last 15 years.

MEN OF THE IRON TRADE

Who they are Where they are What they are doing

Clyde M. Carr, president of Joseph T. Ryerson & Son, Chicago, is traveling in California.

O. R. Robinson, general manager of sales of the Lackawanna Steel Co., sailed recently on a trip to Europe.

Rex E. Nicholson, managing director of the Toronto Structural Steel Co., Ltd., is in this country on a business mission.

Frederick T. Connor, formerly with the Joliet Railway Supply Co., has recently been appointed western railway sales agent for the Carbon Steel Co., Pittsburgh.

Kenneth Seaver, who was recently elected to membership in the American Iron and Steel Institute, graduated from the Phillips Andover Academy in 1896 and from the Massachusetts Institute of Technology in 1900. Immediately after graduation, he entered the employ of the Pennsylvania Lines West as draftsman, and later became transitman in the Maintenance of Way department of the Baltimore & Ohio. He then served for about a year with the American Bridge Co., and in 1903 became connected with the Harbison-Walker Refractories Co., of which he is now chief engineer and assistant general sales manager. Mr. Seaver is the author of a "Study of the Open Hearth" and a "Study of the Blast Furnace" and has also contributed a number of articles to technical publications. He wrote the article on "The Open-Hearth Furnace" in THE IRON TRADE REVIEW series, "The A, B, C of Iron and Steel".

KENNETH SEAVER,
New Member, American Iron and Steel Institute

Muir B. Snow has been elected president and general manager of the Detroit Twist Drill Co., Detroit, to fill the position formerly held by his brother, Neil W. Snow, deceased.

L. R. Custer has been appointed superintendent of the armor plate department at the Homestead steel works of the Carnegie Steel Co., succeeding S. S. Wales. Mr. Custer was formerly assistant to Mr. Wales.

James Warren, 10 Vassar street, has resigned as manager of the Wheeler Foundry Co. at 138 Mechanic street, Worcester. No successor has been appointed, and as yet Mr. Warren has no plans for the immediate future.

Walter A. Johnson, formerly of Atlanta, Ga., has been appointed pneumatic tool manager at the Pittsburgh branch of the Ingersoll-Rand Co., New York. C. F. Overly, formerly of Pittsburgh, has been appointed to the same office in the Cleveland branch.

Official announcement has been made by the Carnegie Steel Co. of the appointment of Albert A. Corey, a brother of W. E. Corey, former president of the United States Steel Corporation, to be superintendent of the Homestead Steel Works, to succeed Col. Azor R. Hunt, who will retire May 1.

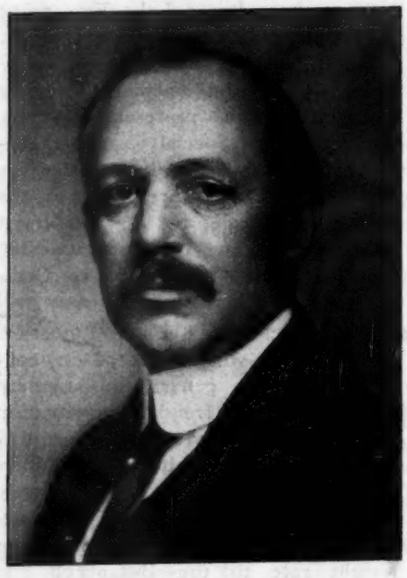
M. Jacque Taffenell, chief of the bureau of mines of the French government, read an interesting paper on mine explosions before Pittsburgh members of the American Institute of Mining Engineers last week. Geo. S. Rice, chief mining engineer of the United States bureau of mines, presided.

Edward D. Thompson has terminated his services as general sales manager of the Deforest Sheet & Tinplate Co., and is now associated with W. R. Thomas in the Metal Post & Culvert Co., a new corporation of Niles, O., manufacturing a line of metal fence posts and corrugated metal culverts.

Charles L. Benjamin, director of advertising for the Cutler-Hammer corporations at Milwaukee, has been honored with election as first vice president of the Central division of the Associated Advertising Clubs of America, and is now in line for the presidency of that organization. Mr. Benjamin was associate editor of Printer's Ink before joining the Cutler-Hammer forces.

John A. Harvin, of the Peden Iron & Steel Co., Houston, Tex., has been elected president of the Southern Supply and Machinery Dealers' Association. Other officers elected were as follows: J. G. Belding, Augusta, Ga., first vice president; Ernest Howell, Charleston, W. Va., second vice president; Alvin M. Smith, appointed secretary and treasurer by the new president.

Charles R. Phipps, a new member of the American Iron and Steel Institute, began work as an errand boy for the Cambria Iron Co., in 1882, and remained with that company for 20 years, during which time he put in four years as an apprentice in the machine shop and a number of years as a general draftsman. For three years, he taught mechanical drawing in the night schools of the Cambria Institute. In 1893, he was transferred to the roll department, and after working in the shop and office for some years, became assistant superintendent of this department. In 1902, he accepted a position as roll designer for the Lackawanna Steel Co., Buffalo, and since 1909, has been superintendent of the roll department.



CHARLES R. PHIPPS,
New Member, American Iron and Steel Institute

Fig. 1—Milling Nine Complete Cylinder Castings at One Time

How Automobile Parts Are Made

A FEW of the machine tool operations involved in manufacturing Maxwell motor cars are illustrated on this page. They indicate clearly the problems that the machine tool builders are called upon to solve in providing equipment for automobile plants, and are particularly pertinent at this time in view of the discussions brought out at the recent meeting of the National Machine Tool Builders' Association at Worcester, Mass.

Fig. 1 shows an Ingersoll milling machine surfacing and finishing the top, bottom and sides of nine complete cylinder castings at one setting. There are 36 operations, performed in 60 minutes. In a day from 85 to 90 cylinders are finished. The machine is motor-driven and practically automatic in its operation.

Multiple Spindle Drill

The Bausch multiple spindle drilling machine, shown in Fig. 2, has 15 spindles. In one operation 10 holes are bored in the top of the casting and five holes on one side. A simple plate jig which can be quickly fastened in place is used. The machine turns out 150 pieces per day and is attended by a semi-skilled, one-operation man.

Fig. 3 shows a gang drill furnished by Foote-Burt Co., Cleveland, for boring connecting rod ends. A 2 3/32-inch drill is used, running 112 revolutions per minute, the feed being 0.008 inch per revolution. Each spindle turns out 250 pieces per day. A box jig provided with a suitable bushing for guiding the drill is used.

FIG. 2—DRILLING 2,250 HOLES PER DAY

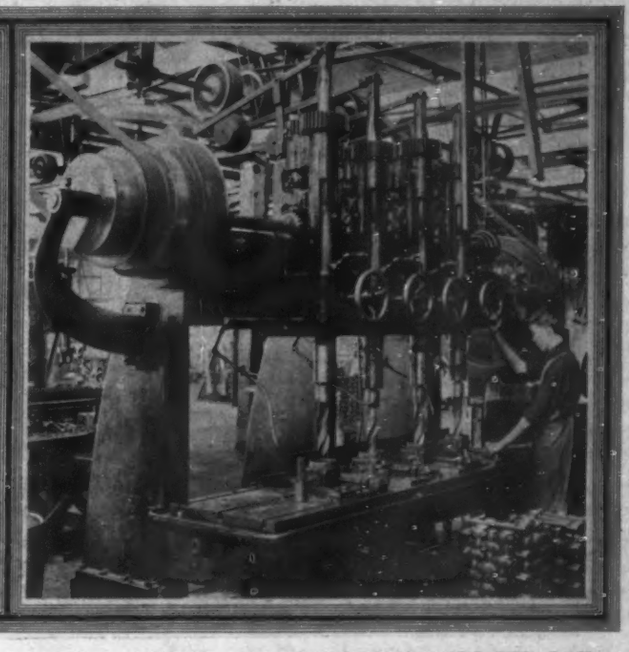


FIG. 3—BORING 1,000 CONNECTING RODS PER DAY

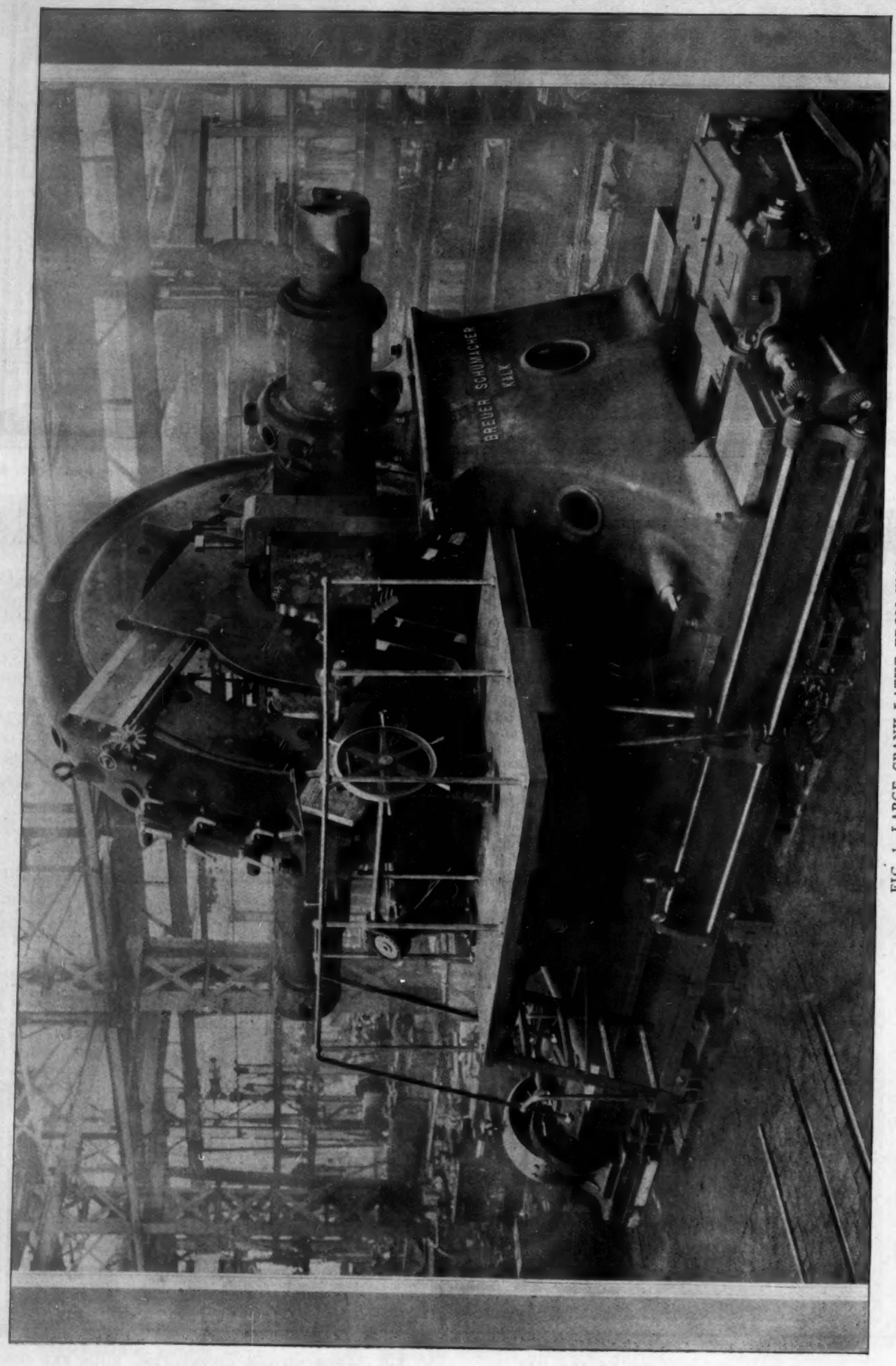


FIG. 1—LARGE CRANK LATHE FROM WORKING SIDE

Precision Lathe of Large Size

Interesting Details of a Powerful German Machine for Turning Large Engine Cranks

Specially Translated for The Iron Trade Review

BY GUSTAV FISK

AS THE result of the demand for precision in machining crank shafts, special machines have been in general use for some years. But they have rarely been employed for journals of large dimensions on account of the great difficulties in design and manufacture, encountered in rationally complying with the extraordinary precision required of these machines. Recently, however, it has proved necessary to build such machines for very large and heavy work. A particularly heavy machine of this kind has been constructed by Breuer Schumacher & Co., A. G., in Koln-Kalk, Germany. It was recently delivered from the shop after a rigid test, which is said to have resulted in an entirely satisfactory manner. The main dimensions of this machine are given in the accompanying table.

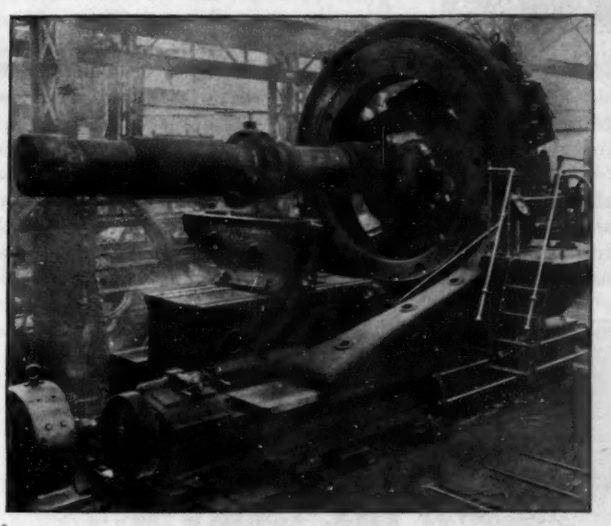


FIG. 2—LARGE CRANK LATHE FROM DRIVING SIDE

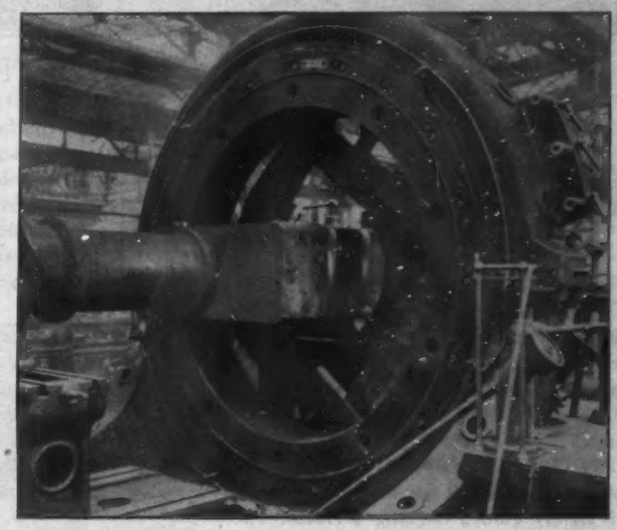


FIG. 3—TAKING A ROUGHING CUT

Overcoming Difficulties

Due largely to the broad experience of the manufacturers, the difficulties connected with the construction of a machine of such giant dimensions were successfully overcome. The builders claim that the machine not only offers the desired precision, but also meets the most severe demands of heavy and quick roughing work.

Some idea of the unusual size of the machine can be had from Fig. 4, showing a man standing on the operating platform. A bed plate, which carries a large housing, and two pedestals constitute the main parts of the machine. After the crank shaft is secured to the pedestals, it is accurately adjusted by means of a vernier. For further security, the crank is immovably held in its fixed position by a clamp. The clamp, which is screwed firmly to the shoulder of the crank, is attached to the right hand pedestal, as shown in Figs. 1 and 4. The introduction of the crank shaft into the pedestal bearings is facilitated by removable caps, which are pivoted and can be easily swung into place.

The machine is driven by means of a step motor and two sets of spur gears enclosed in a casing. The gears shift on a splined shaft and for the purpose of easy engagement the flanks of their teeth have been rounded off by special machines. To decrease the wear to a minimum, all the gears are made of chrome-nickel steel with broad involute teeth. A heavy shaft, resting in bearings in the bed plate, transmits the power to a pinion driving the tread ring. To insure smooth running, as far as possible, the tread ring gear wheel is made of cast steel with broad teeth, cut with great care.

PRINCIPAL DIMENSIONS OF CRANK LATHE

Inside width of tread ring, feet...	8.5
Travel of housing on bed, feet...	5.25
Bore of pedestal bearings, inches.	27.5
Speed of tread ring, revolutions per minute	0.2 to 8
Power required about, horsepower.	50
Total weight, about, pounds.....	175,000

Tread Ring Design

To insure with certainty against any tilting tendency, the guiding surfaces of the housing, in contact with the bed, are made especially long. The tread ring proper rests in the annular space of the housing. In designing the tread ring, the following items have been given special attention:

First.—The stiffness of the ring in spite of its enormous weight of 33,000 pounds, is insured by casting it as a hollow box section. The friction resulting from even a minute deflection would cause inadmissible heating and expansion phenomena.

Second.—The friction is reduced to a minimum by making the bearing surface of greatest possible width, thus cutting down the weight carried per unit of area.

Third.—The accurate readjustment of the ring, in view of the high precision demanded, is provided by making the end of the ring tapering and holding it in position by conical fillets, which furnish an extremely sensitive means for adjustment.

Fourth.—To avoid undue heating effects, the wearing surfaces of the ring are provided with oil grooves piped to a powerful plunger pump. Through special grooves in the housing the oil run-off is conducted to a collecting basin, so that there is prac-

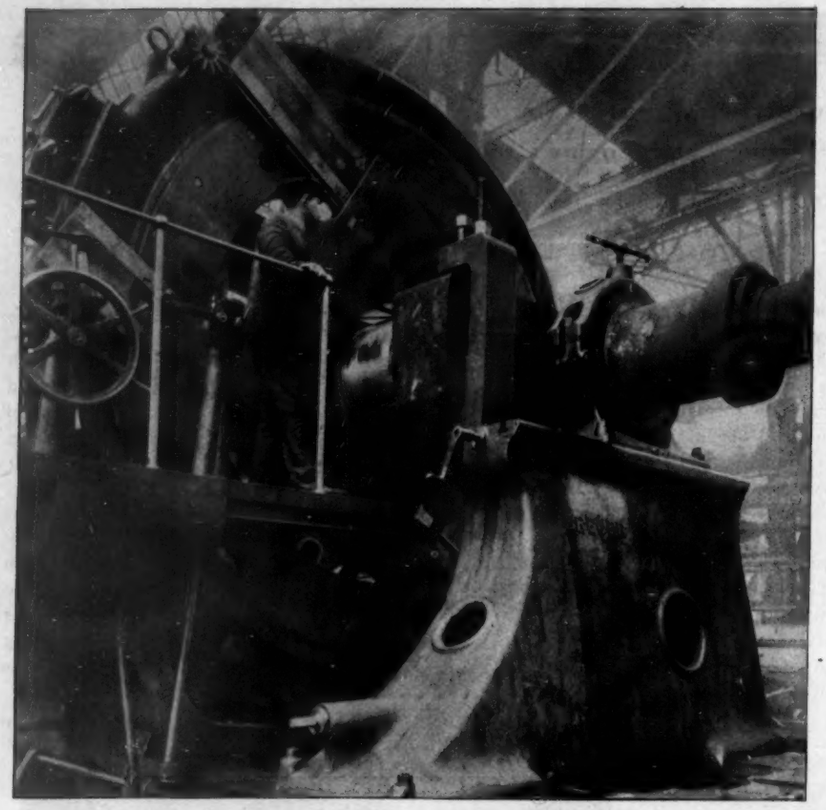


FIG. 4—SLIDING PEDESTAL AND CLAMPING DEVICE

tically no waste. A careful inspection of the ring after the test run showed that the wearing surfaces of the ring were covered with a uniform film of oil.

Housing Made in Two Parts

On account of the great dimensions of the tread ring, Fig. 5, the housing has been made in two parts. This was done in order to facilitate casting and erection. The inside width of the ring is 8½ feet. The ring itself carries two finished cast steel cross beams for guiding the traveling tool holders. The latter are cast of steel and are rigidly guided on long surfaces. The tools rest in special supports accurately adjustable by hand; they are secured to the tool holders by heavy screws.

The housing is shifted through a gear case, mounted at one end of the bed plate. This allows a displacement of from 0.008 to 0.315 inch. A heavy lead screw, located inside the bed plate, and a feed nut in the housing transmit the motion. Another mechanical apparatus is provided for the rapid travel of the housing in both directions. For the purpose of accurate hand-adjustment, the feed nut may also be turned by hand from a hand-wheel on the operating platform. This wheel operates through worm gearing. The feed in a radial direction is effected by ratchet wheels and pawls, as shown in Figs. 1 and 5. A number of such wheels and catches are provided to facilitate a gradual adjustment to the desired size.

The two pedestals traveling on the bed plate are movable by hand by means of racks and pinions. A clamping device of particularly heavy design, is carried on one of the pedestals; it serves to secure the crank web in a fixed position. For precise lateral adjustment of the crank shaft, the pedestal bearings are made movable along vernier scales.

Work Must Be Watched Carefully

Due to the great precision of the work, it is absolutely necessary to continuously and carefully watch the machine and the tools during operation. To that end the housing is provided with a roomy platform, from which all the operations are controlled. It is unnecessary for the attendant to leave the platform while the machine is working. Fine hand adjustments, the operation of the mechanical feed, as well as any rapid shifting can be promptly performed, as the respective hand-wheels and levers are all within easy reach of the operator. Also the speed of the machine is controlled from the operating platform by the aid of a so-called self-starter. The starting, stopping and regulation of the motor is controlled by push buttons.

The specifications for the machine were particularly severe. The problem was to turn a crank shaft weighing not less than 40 tons to within 0.0008 inch. The crank shaft had a throw of 31.50 inches, and the diameter of the crank pin was 23.62 inches. As shown in Fig. 4, the crank journal was roughed out from the full square, which had to be turned into a round before the finishing work could commence. This roughin- was done by

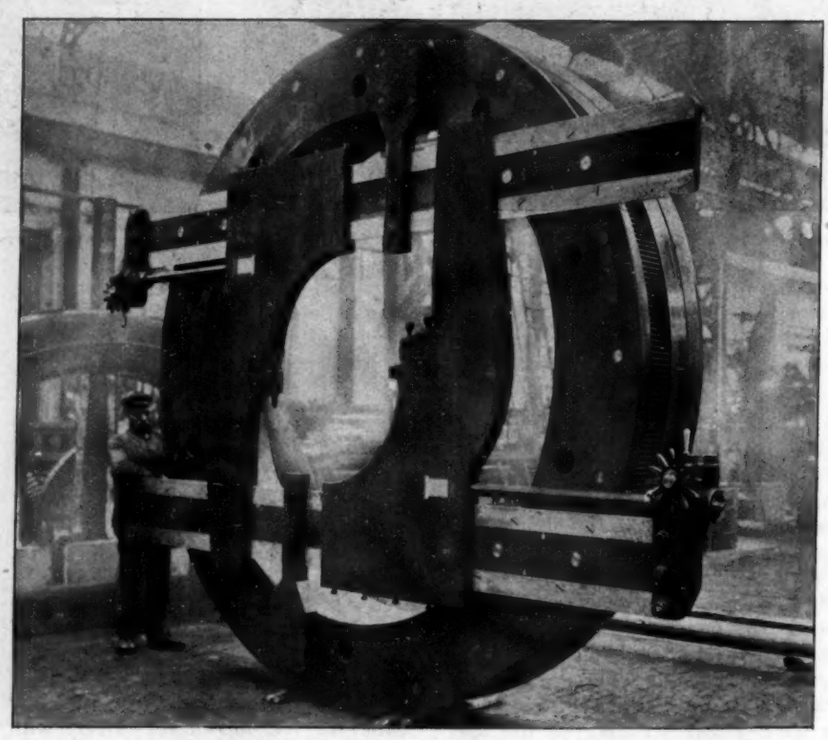


FIG. 5—TREAD RING WITH TRAVELING TOOL HOLDERS

radial cutting, using both tools. An approximate idea of the cutting ability of the machine can be realized from the cross-sectional area of the chips, which amounted to about 0.14 square inch during the roughing operation. Fig. 3 shows the machine during the second radial cut. It should be noted, however, that the foregoing figure does not represent the full capacity of the machine, as the test was conducted with the machine mounted in the shop on a temporary, loose foundation; whereas the machine in actual service will be set on a solid foundation, which will be of proper size. By means of recording ammeters accurate measurements of the power consumption were made during the tests. It was found that about 5 horsepower was required when running the machine at no load and to about 24 horsepower when taking a roughing cut.

Broadening Our Foreign Trade

BY A H BALDWIN

THE department of commerce is essentially the business man's branch of the executive service. It fails to fulfill its functions successfully if its work does not result in material assistance to the commercial interests of our country. The law says that the department shall "foster, promote and develop" commerce, mining, manufactures, shipping, fisheries and transportation. To carry out these purposes there have been established facilities which stretch over the entire world in their ramifications.

Our service, like most promotive service, is essentially one of active publicity. We make use of all the vast resources of the federal government, both at home and abroad, to collect the facts of trade, and we distribute this information by methods which are designed to reach most promptly and directly our clients. We have established an elaborate system with its threads stretching out from Washington to every important port and capital, and every large commercial city in the world where a representative of the United States government is stationed. These men are watching the currents of trade day by day; their commercial reports reach the bureau of foreign and domestic commerce by tens of thousands yearly. In foreign countries our consuls are our "correspondents on the spot", and much of their work is in the field of commercial promotion. Over 300 of them, one in every important trade center, are on the alert to see and report facts which will aid our commercial interests. Since that service has been established on the merit system, with trained men who are kept on through changing administrations, our consuls rank with the best in the world; and, as far as their other duties will permit, they are devoting their time and skill to writing trade reports and to other commercial promotive work.

In Washington, our office is a sort of clearing house for all this great volume of facts. It is, of course, the administrative center of the work and has its branches for editing, translating and digesting trade reports. Our statistics are compiled, foreign journals are read and translated, and relations are maintained with all the parts of the federal establishment at the seat of government. Close relations are also established with commercial organizations of all kinds in the United States, with chambers of commerce, boards of trade, manufacturers' associations, and these associations serve us admirably as allies in the work of trade promotion, vastly supplementing and making more effective the distribution of our material.

The remainder of our task is to obtain the most prompt and efficient distribution possible for this trade information which flows in upon us from so many sources. We make use of every legitimate facility at our disposal to accomplish this part of our service effectively. We print an edition of 20,000 copies daily of the Consular and Trade Reports, mostly devoted to foreign trade. We issue a Monthly Statistical Summary, showing our imports and exports of all kinds, raw material and manufactured products, gold and silver. We print a quarterly showing our imports classified by the designations of the tariff law. The Statistical Abstract is issued yearly by our office, and we also print a big statistical volume of nearly 1,000 pages called the "Commerce and Navigation of the United States". Last year we wrote over 100,000 letters, most of them giving trade information of some kind to our correspondents, and we sent out more than that number of copies of Confidential Circulars in regard to trade opportunities of all kinds, special books and pamphlets such as the South American Trade Directory, Alexander's reports on markets for tools and machinery abroad, Odell's reports on cotton textiles, Shriver's reports on canned goods, Thayer's reports on proprietary medicines, Special Consular Commercial Reports, such as Consul General Snodgrass' Monograph on Russia, Commercial Agent Robinson's pamphlet on Canada, make up the balance of our publicity service. We try to distribute all this information in a way to reach the right man direct. We keep records of American manufacturers and exporters classified by industries or the products and foreign countries in which they are specially concerned. Thus, we send to the shoe manufacturer the shoe news, and to the locomotive man the locomotive news, and so on, as far as we can.

Now the secretary is asking congress to strengthen all the branches of the service of the bureau; first, the collection of trade information; next, its handling in Washington, and last its prompt and efficient distribution to business men. For our foreign service we now depend on the consuls and upon a small corps of commercial agents. The consuls, effective as they prove themselves in reporting on current trade matters in their districts, have many other duties which absorb their time and usually prevent any continued study of special trade matters free from the distractions of routine duties. Further, their posts require their attention pretty continuously, and to indulge in extensive travel is usually not practicable for them.

The secretary asks that congress provide for a special corps of "commercial attaches" in 14 foreign posts to supplement the consuls in fields which they are too busy to care for and which we feel can be best developed by agents of the department of commerce. At London, Paris, Berlin, Vienna, Buenos Aires, Tokyo, Peking, Lima, St. Petersburg, Rio, Santiago, Rome, Johannesburg and Melbourne, if the plan is approved, will be stationed representatives of the department of commerce whose sole duty will be to promote the commercial interests of the United States. They will have offices, with a clerk-assistant, and will be free to travel on special investigations such as a consul cannot be expected to make for our department. They must be

Abstract of a paper presented at the Worcester meeting of the National Metal Trades Association, April 21-22. A. H. Baldwin is chief of the Bureau of Foreign and Domestic Commerce.

trained men, able to speak the current language of the country in which they are stationed, and it is hoped to obtain men who have already demonstrated their ability in this field. That such a corps of well-selected commercial experts cannot fail to be of greatest value to our foreign trade is not open to any question.

Further, the present appropriation for commercial agents, recognized specialists in trade lines, is to be much extended, and a special fund of $100,000 is asked for the current year, to be used in studies of the various branches of the great commerce of South America, which we hope to share in larger proportion by such efforts. Here, too, men trained in technical branches of commerce will be sought by the department, in order that their training and knowledge may be placed at the service of all American manufacturers and exporters.

As a link in the chain, the co-operation and interest of the business man himself is necessary. And this last, the most difficult to accomplish, is most important of all, as the work falls to the ground unfruitful unless it is accepted by the manufacturer and exporter, the merchant and the commission house. To be of real value, the business man must approve it, must acknowledge its worth, and must use it day by day to aid him in the conduct of his affairs. All this vast governmental system of collecting and distributing the current trade history of our times—a system so far-reaching that its agents are in every large commercial city and port in the world, costing our people many hundreds of thousands of dollars a year to maintain—must justify its existence by the practical results of its work. The commercial interests, all interests in fact in the United States, should be fully advised as to the character of this great organization, should insist on the maintenance of high standards of training and efficiency in the personnel of every department, should resist any effort to make it an instrument of special privileges of any kind, partisan or otherwise, and should familiarize themselves with the details of its activities for the better development of our commerce and the greater glory of our country.

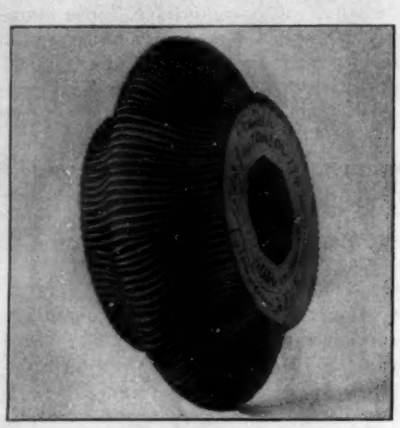


FIG. 1—MILLING CUTTER MADE IN THE EIGHTEENTH CENTURY

Old Milling Cutters

In a paper read at the 1913 convention of the National Machine Tool Builders' Association, B. F. Waterman, of Brown & Sharpe Mfg. Co., Providence, R. I., stated that the first milling cutters were used for cutting the teeth of gear wheels. One of the oldest examples of a cutter of this sort is illustrated in Fig. 1. It was made some time previous to 1782 by the celebrated French mechanician Jacques de Vaucauson, who lived between 1709 and 1782. It came into the possession of the Brown & Sharpe Mfg. Co. about 20 years ago, The cutter is an excellent piece of workmanship and might be called a rotary file. The teeth were undoubtedly cut out with chisels cut to the proper contour. It will be noted that the cutter has an octagonal hole and judging by the way the metal at the edge of the hole is broken out, it was produced with a broach but not very successfully.

The first milling machine of which there is any historical account is illustrated in the French encyclopedia published in 1792. It was designed for milling the exterior of musket barrels. Ely Whitney of cotton-gin fame made the first milling machine used in the United States early in the nineteenth century. It was built to manufacture muskets.

It is evident from the foregoing that the first cutters were designed for producing irregular forms and not for milling flat surfaces. The teeth were cut with a chisel, filed to an edge and then hardened. The next method of producing milling cutters was to form the blank in a lathe and gash it until the edges were nearly sharp, when they were given the necessary clearance with a file. When the cutter became dull it was necessary to anneal it, after which the faces of the teeth were upset; then the cutter was reformed in a lathe to fit the gage, filed and rehardened, when it was ready for use again.

In November, 1864, Joseph R. Brown, one of the founders of the Brown & Sharpe Mfg. Co., patented an improved cutter for cutting gear wheels. It is what is now known as a backed-off cutter and could be ground without changing its shape. Fig. 2 shows some extreme forms of backed-off cutters. They are made for milling the breech blocks for 12-inch guns, and their size may be judged by comparing them with the 1-inch end mill shown in the foreground. This illustration shows pretty well the possibility of backing-off cutters of large dimensions, although far more intricate shapes are now being made every day.

FIG. 2—LARGE BACKED-OFF MILLING CUTTERS

The Cutler-Hammer Mfg. Co., Milwaukee, now is manufacturing and marketing the electric gear shift heretofore made by the Vulcan Motor Devices Co., Philadelphia. This equipment already has been adopted on a number of high grade motor cars and other manufacturers are negotiating with a view to making this device one of the features of their 1915 models.

Automatic Machine Tool Control

How the Rheostat Relay Governs the Speed of Motors and Saves Time in the Shop

BY H W EASTWOOD

BEFORE the advent of the series contactor for controlling electric motors, automatic control was both too expensive and too complicated for machine tool service, but since the introduction of this invention it is rapidly replacing the manual control schemes of other days in machining operations, just as it has already replaced manual control in the steel industry.

The most important item in the automatic control system is the accelerating unit. This consists of a train of series contactors mounted on a slate panel back of which is a bank of resistance enclosed in a suitable frame. A self-contained unit is especially desirable for machine tool service because of the greater simplicity of wiring and the smaller space which it occupies. In most applications it is necessary to use in connection with the accelerating unit, an operator's switch, the function of which is to change the connections between the motor, the accelerating unit and the line in such a way as to perform the various functions of starting with current limit acceleration, stopping by dynamic braking with current limit deceleration and reversal. The operator's switch is simply a small drum controller constructed along standard lines.

The Rheostat Relay

Since most machining operations require adjustable speed, a shunt field rheostat to which has been added a field rheostat relay is also usually required. The shunt field rheostat is familiar to every one but the rheostat relay is a comparatively new development. It includes a series coil wound to suit the horsepower of the motor with which it is to be used and a moving element consisting of a plunger which carries at its lower end, a copper disk. When the latter is raised by the magnetism generated by the current flowing through the coil it bridges a pair of contactors. The coil is connected in series with the motor and the contacts are connected to the terminals of the field rheostat. The relay is adjusted to raise its plunger when the current flowing through its coil slightly exceeds full load. If the field rheostat is set for high speed and the circuit is closed to start the motor, the plunger of the relay is immediately raised and the field rheostat short circuited, thus giving the motor full field strength. As soon as the current drops below full load, the plunger of the relay drops, cutting the rheostat back into circuit and causing another peak of current, which again lifts the plunger. This fluttering or telegraphing of the relay continues until the motor has been stepped up to the speed for which the rheostat is set. It will make from 50 to 75 operations in accelerating a motor with four to one speed variation from normal speed to maximum speed.

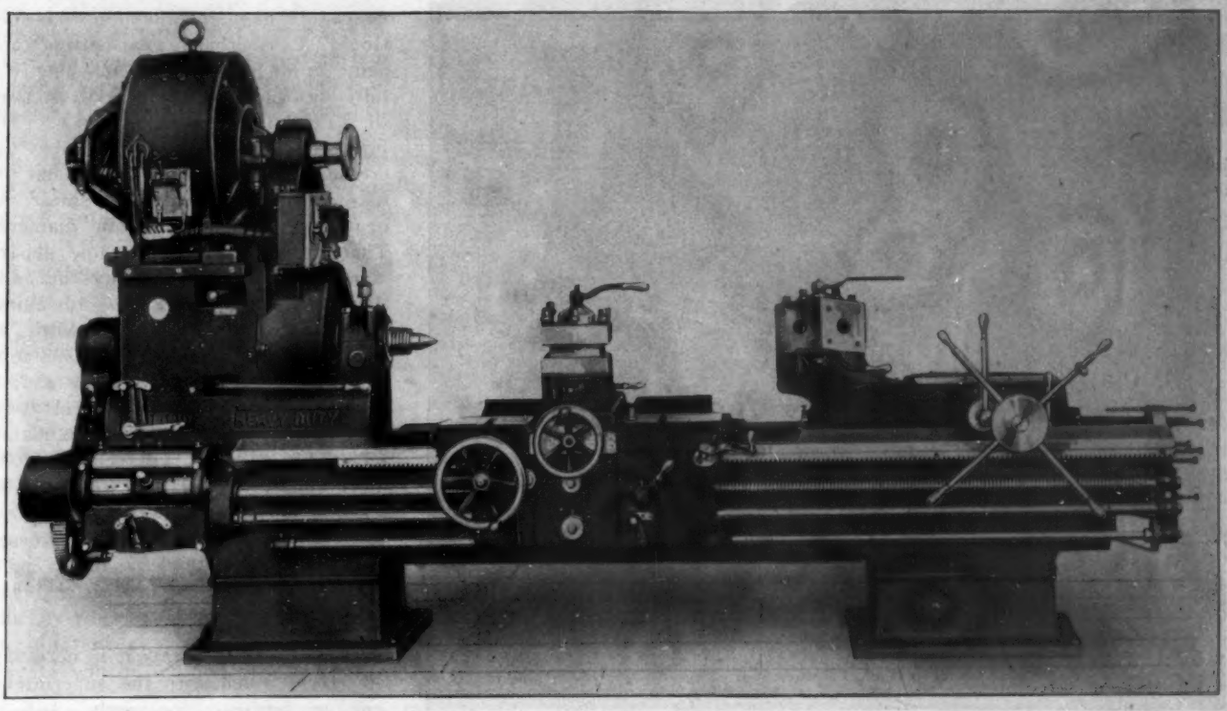


FIG. 1—LATHE EQUIPPED WITH AUTOMATIC CONTROL

The field rheostat relay, in effect, gives to the automatic control system a vastly increased number of accelerating points. It protects the motor in accelerating above normal speed, just as the series contactors protect the motor in accelerating up to normal speed.

In steel mill operation, motors are ruined by too rapidly cutting the resistance in series with the armature out of circuit. In machine tool operation, it is safe to say, more motors are ruined by too rapidly inserting resistance in series with the shunt field than in any other way. The field

Abstract of a paper read before the Pittsburgh Society of Iron and Steel Engineers.

rheostat relay eliminates this very prolific source of trouble and is to be appreciated accordingly.

The general advantages of automatic control are well known but it has some particularly valuable features for machine tool operation which deserve emphasis. The motor is accelerated in the shortest safe time under the control of current limit acceleration and is stopped in the shortest safe time by dynamic braking with current limit deceleration. The saving in time, and therefore the increased productive capacity resulting from starting and stopping promptly are frequently matters of the utmost importance. Many examples could be given of specific machines whose production has been increased from 40 to 100 per cent as a result of this saving in time. Automatic control institutes a new division of labor. Formerly the machine hand was compelled to be a motorman in addition to being a machinist. In the automatic control system, the brains necessary for the safe and prompt starting and stopping of the motor are put into the control device and the operation which the workman has to perform is so simple as to easily become instinctive. The importance of having the workman devote his undivided attention to his specific task has recently been emphasized by the advocates of scientific management. The division of labor is the great economic principle upon which our whole modern factory system rests and the value of this new division of work, although it cannot be calculated in dollars and cents, is none the less certain. As an immediate result of the field rheostat relay, tools may always be worked at the most efficient cutting speed. The speeds may be marked on the drawings and the field rheostat may be set by the foreman of the department with full confidence that the machine will return to the desired speed after every stop. The importance of cutting speeds in machining operation is every where appreciated, and the field rheostat relay is almost the only device which makes a satisfactory solution of the problems involved possible.

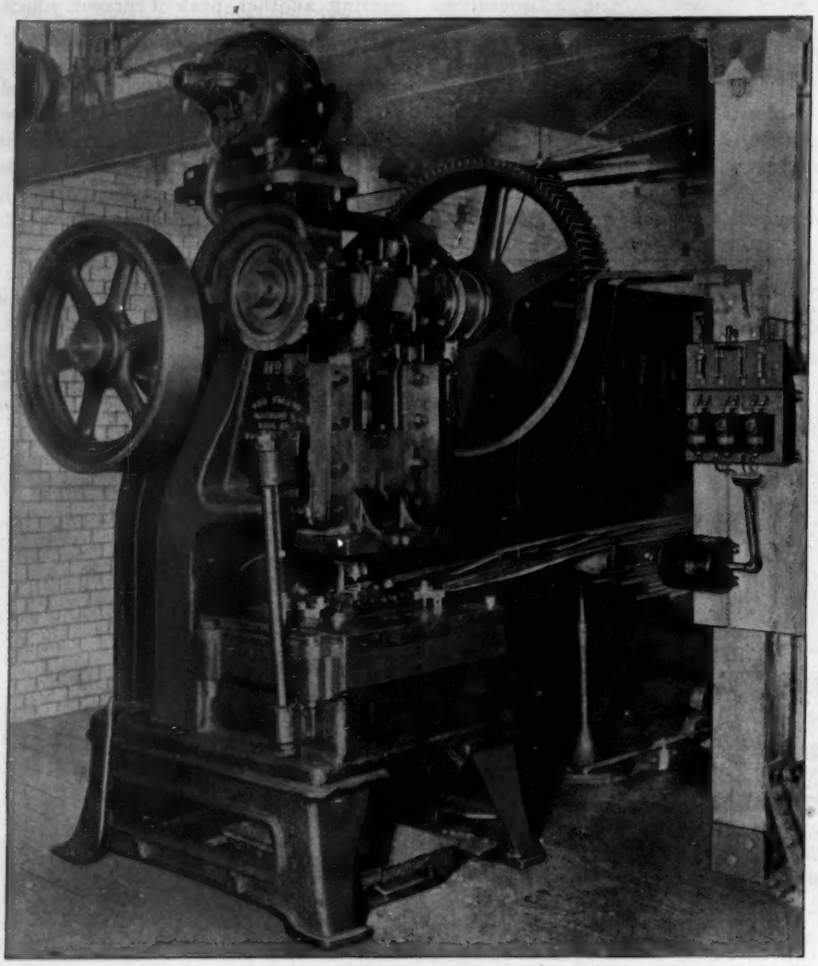


FIG. 2—PUNCH PRESS PROVIDED WITH A RHEOSTAT RELAY

This system of control, has been applied to all classes of machine tools with excellent results. The large punch press shown in Fig. 2 is started in ten seconds by automatic control whereas it formerly required 20 seconds with manual control. It is stopped in 2¼ seconds by dynamic braking as against 24 seconds by friction. The manufacturers of the lathe shown in Fig. 1 estimate that the prompt starting and stopping effected by automatic control has increased the capacity of their machine 40 per cent in certain classes of work. The manufacturers of a certain shaper make a similar statement regarding their machine. Results as good or better than these are being obtained on milling machines, slotters, boring mills, threading machines, screw machines, etc.

Foote Enlarges

Owing to the unusual demand for large, heavy cut gears where cast tooth gears have been used heretofore, Foote Bros. Gear & Machine Co., Chicago, has installed a 144-inch Gould & Eberhard gear-cutting machine in its plant. This machine was fully described in the March 26 issue of THE IRON TRADE REVIEW. The Foote Bros. company has also increased its hobbing department to take care of helical and spiral cut gears up to 40 inches in diameter. The automatic screw machine department has been enlarged by the addition of several large new machines and can now handle bar work up to 4½ inches in diameter. The company also expects to install shortly a generator for cutting spiral tooth bevel gears up to 18 inches in diameter. This addition will require 10,000 more square feet of floor space in the machine shop.

A Time Saving Call System

In many large plants it is necessary to get in touch with the superintendent or foreman frequently, and although telephones may be located at different points throughout the plant, a great deal of time is lost in calling the different stations to locate the party wanted. It is also inconvenient to send a messenger after him. The Menominee Electric Mfg. Co., of Menominee, Mich., is manufacturing a system which overcomes these objections. At different points in the factory stations are placed and at each station a large bell is mounted. The parties who are to be called, hear the bell and by glancing at the station can see at once if they are wanted. Several different methods are used for designating the different parties.

Heavy Cold Shear

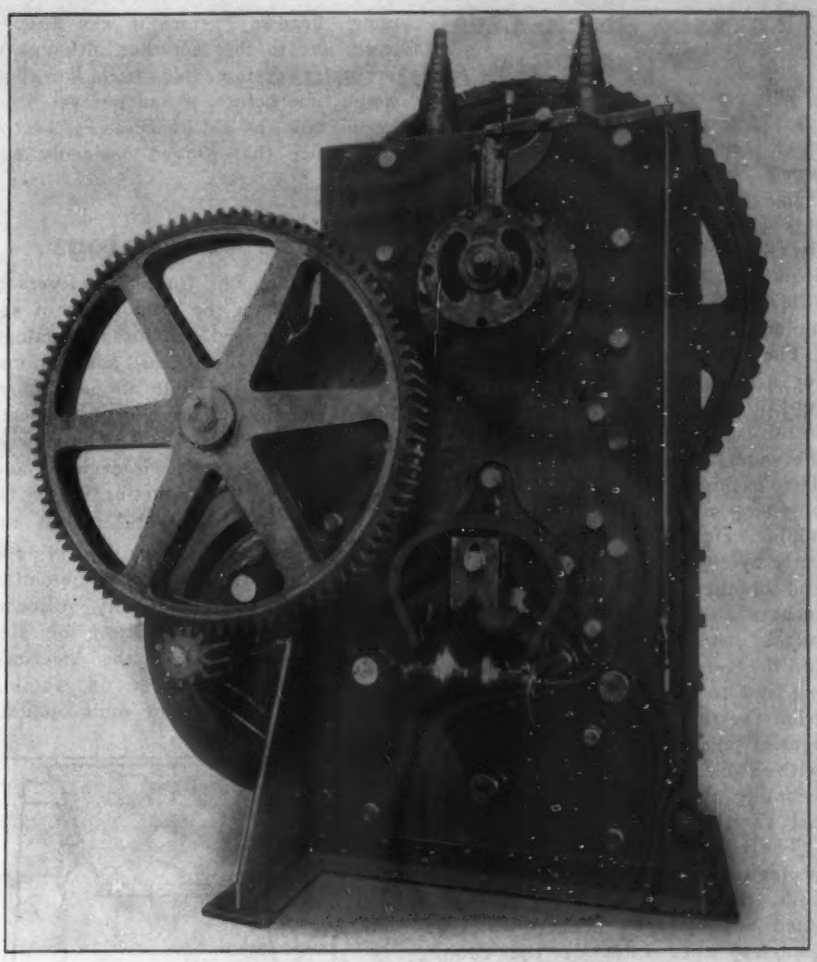
A shear for cutting cold stock built along original lines is being marketed by Henry Pels & Co., New York. The one illustrated herewith is designed to cut 6½-inch round and 6¼-inch square steel bars having a carbon content of about 0.25 per cent. Brief reference to a similar shear built to cut 4-inch stock was made in a description of the plant of the Western Drop Forge Co., at Marion, Ind, published in THE IRON TRADE REVIEW, March 19, 1914.

The frame, which is built entirely of rolled steel, consists of two heavy plates reinforced by angles, gusset straps and steel castings. The frame is said to be practically unbreakable. The shafts, which are hammered steel of large diameter, run in phosphor bronze bearings.

The machine is operated by means of a small hand lever on the right side, which engages a three-way clutch. The latter has certain patented features which make for instantaneous action. The sliding head of the machine travels in V-shaped guides, which are lined with phosphor bronze. The design of these guides enables the operator to use knives with a minimum of clearance and insures a straight cut.

The shear makes six strokes per minute, the strokes being 4⅛ inches in length. A 50-horsepower motor is required. The machine is 14 feet, 2 inches in height over all; 7 feet, 9 inches in width and 11 feet, 7 inches in length. It weighs approximately 60,000 pounds.

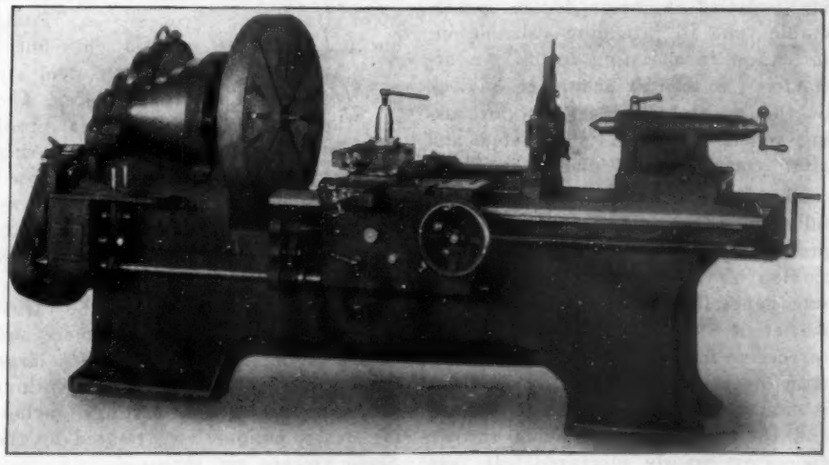
The head of the machine is supported by conical counterbalancing springs equipped with adjusting bolts. The motor is mounted on top, and the belt is connected with the rim of the fly-wheel. The knives are made in different shapes, according to the use to which the machine is put.



SHEAR WITH FRAME BUILT OF ROLLED STEEL

Extension Gap Lathe

The accompanying illustration shows a new sliding, extension gap lathe, which has recently been placed on the market by the Barnes Drill Co., Rockford, Ill. The lathe swings either 22 or 36 inches, the length of the bed being 8½ feet. The main and sliding beds are planed and scraped together and are unusually heavy. They are firmly braced throughout their entire length. The top bed is 24⅞ inches wide and extends beyond the main bed in order to provide a firm support for the carriage when turning work of large diameter through the gap. This eliminates the necessity for an auxiliary brace when working in the gap. The cone steps are of large diameter and are arranged for a 3-inch belt. The lathe is especially adapted for heavy jobbing, machine and general repair shop use, and for some lines of manufacturing work where the expense of a standard 36-inch lathe would not be warranted.



EXTENSION GAP LATHE

The Wisconsin Steel Co., Chicago, a subsidiary of the International Harvester Co., is rebuilding its No. 1 blast furnace and it is expected that the work will be finished about June 15. The old furnace was 19 feet in diameter and 80 feet high, with an annual capacity of 10,000 tons per month. The new furnace will be 22 feet in diameter and 90 feet in height, with a capacity of 15,000 tons per month. The new furnace is provided by some special features which permits its being placed in the same space being occupied by the old furnace. A new hot blast stove is also being constructed.

Furnace Stock Line Protection

The protection of the inwall of a blast furnace in the vicinity of the stock line has been the subject of much discussion and the object of many inventions. A new device of this character has been installed at the Keystone furnace of the Reading Iron Co., by Frank C. Roberts and Albert Broden, Real Estate Trust building, Philadelphia.

The usual brick inwall is displaced for a distance of 16 feet below the top of the furnace by a cylindrical metal casing supported from below by the outer metal shell of the furnace. The casing is arranged to support only its own weight, the charging hopper, etc., being carried independently by the furnace shell. The upper end of the casing is secured to the furnace shell by an annular wrought metal diaphragm designed to allow for the vertical expansion of the casing and to prevent the escape of gas from the furnace. The outside of the central part of the casing is provided with a circular spray pipe and distributing troughs to permit of external water cooling.

The upper end of the brick inwall is protected by castings containing pipe coils, through which water is circulated, and by water pockets which accumulate the water of the cooling system before it overflows to the waste. The gas downcomer is connected to the casing by a flanged joint so designed that the casing may expand vertically without disturbing the downcomer. With the exception of the upper ring, which is cast iron, the casing is made of the steel castings, heavily ribbed and banded.

A series of openings are provided through the furnace shell around the bottom and the top of the casing; a rapid air circulation takes place through these openings and over the casing.

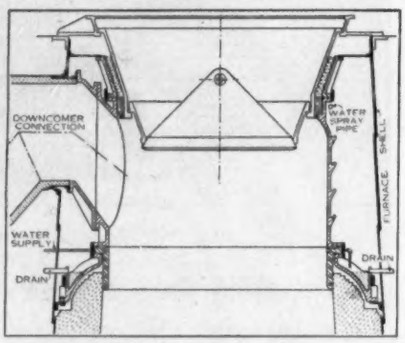
While provision is made for external water cooling, the experience of the Reading Iron Co. has demonstrated that air cooling is sufficient under ordinary conditions and that water cooling is only necessary in emergencies. It is essential, however, to circulate water continuously through the coil casting that protects the upper part of the inwall.

A motor manufacturing company suffered a bad loss from a fire which started in a small wooden shed at one end of the machine shop. The masons kept their clothes in the shed and a hot pipe left in the pocket of a coat started a blaze which gained much headway before it was discovered, due to the fact that, although a sprinkler system had been installed some time before, it had not yet been connected up—an unnecessary bit of negligence that proved decidedly expensive.

Size of Catalogs

Some time ago Joseph T. Ryerson & Son took up the proposition of securing a standard size for all catalogs with several advertising associations. It seemed at that time almost impossible, since so many were advocating the 9 x 12 size. The company, therefore, made its own decision and began a series of bulletins 8½ x 11, which were later to be placed together in a large loose leaf catalog.

The committees recently appointed by the Technical Publicity Association, the American Society of Mechanical Engineers and the American Institute of Architects on catalog sizes are now all of the same opinion,



STOCK LINE PROTECTOR

that the 8½ x 11-inch size for both bulletins and catalogs is best.

In the mechanical field particularly, great reliance is placed on the file of catalogs maintained, which in effect becomes a reference library. In full recognition of this condition many of the larger firms have their high salaried engineers devote considerable time to providing valuable information in a lasting form. An attractive booklet reaching the desk of the general manager or purchasing official is much appreciated and after examination is placed on file.

The files of a busy man are carefully maintained and arranged for prompt reference. If the attractive catalog of the manufacturer is of the size generally favored, its filing is a matter of routine and a place is ready to receive it. If, however, it is larger than the other books in the file, there is no specified place that it will fit and the chances of its being thrown away are greatly increased. It may be thrown into a pile with similar odds and ends, where it soon becomes frayed and is destroyed at the next cleaning up.

When one considers the multiplicity of sizes of catalogs in use today, the advantage of a standard size is at once demonstrated. An argument advanced against uniform sizes of catalogs is that individuality would be sacrificed if all catalogs were uniform. A freak size does not tend toward individuality, but lessens the chance of the catalog being retained by the recipient. If individuality is desired, this can be provided on the inside pages and the cover. A catalog is not for the purpose of exhibiting the individuality of the house publishing it, but to give such information to customers as will be most useful to them.

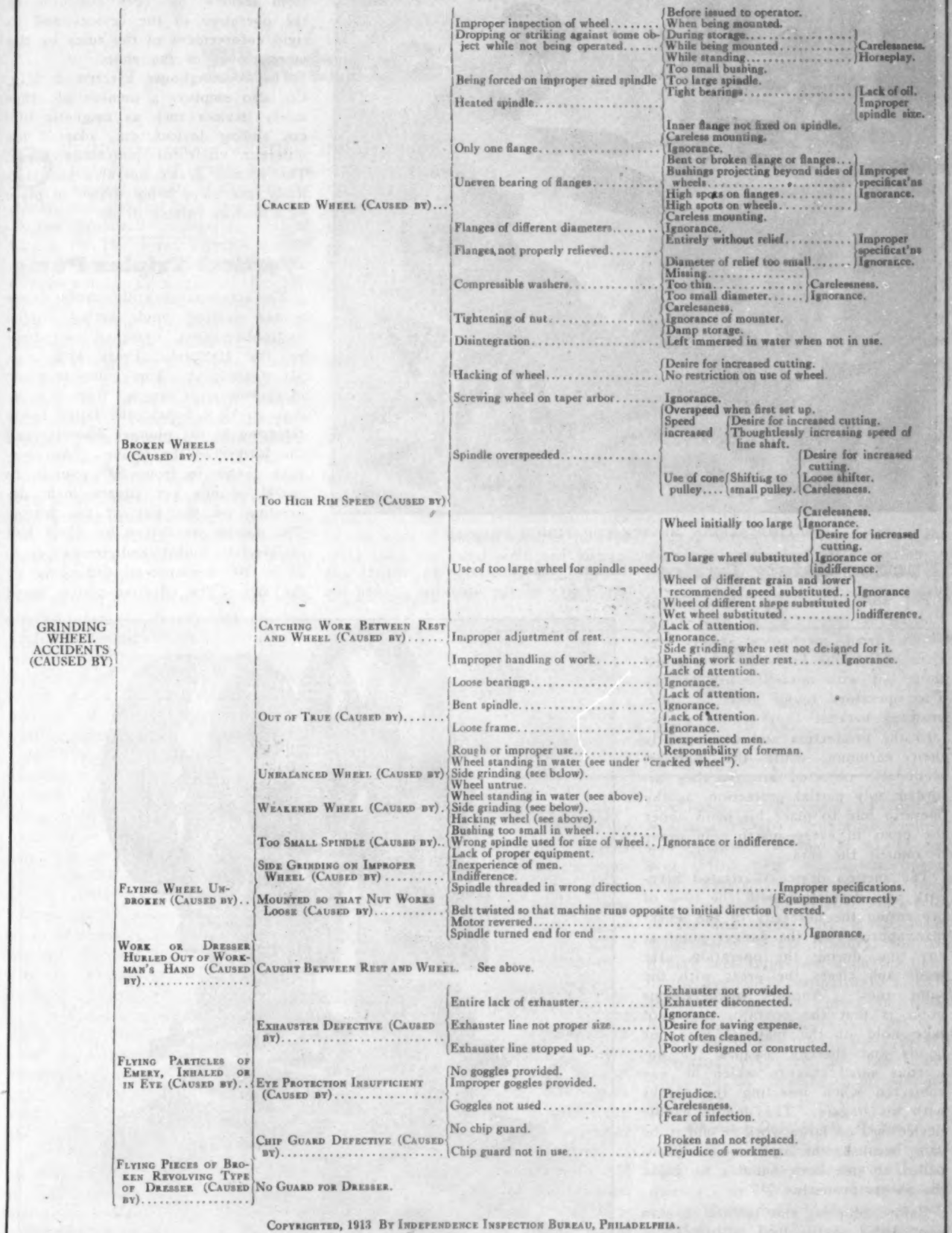
This matter has been under investigation by the committee of the Technical Publicity Association for the past 18 months, and its investigations have led to the recommendation of 6 x 9 and 8½ x 11 inches for standards for all purposes. Both of these sizes will cut to good advantage with a minimum of waste from catalog papers now carried in stock by paper manufacturers. Another advantage of the larger size is that catalogs of these dimensions can conveniently be filed with correspondence, as this size will fit standard filing cabinets very nicely. For paper-bound catalogs, the cover should be trimmed to the exact size of the inside pages. Deckel edges and overlapping edges make catalogs less convenient to handle and should be discouraged.

Stroh Hardening Process

A handsomely illustrated booklet, devoted to the Stroh steel-hardening process, has been issued by the Stroh Steel Hardening Process Co., Pittsburgh. By this method the finest alloy steel and ordinary soft steel are cast together in one solid piece. The resulting casting has a wear-proof alloy steel stratum upon the wearing surfaces, while the body is composed of any desired steel and is in no way affected. It is claimed that this alloy can neither spall, spread nor flow and its depth or thickness is absolutely under control and can be varied according to the size of the piece and nature of the service desired. A large number of illustrations of various kinds of rolling mill castings, including gears, pinions, etc., treated by the Strol. process, are shown.

WHY YOUR GRINDING WHEEL BREAKS

HELP TO PREVENT ACCIDENTS



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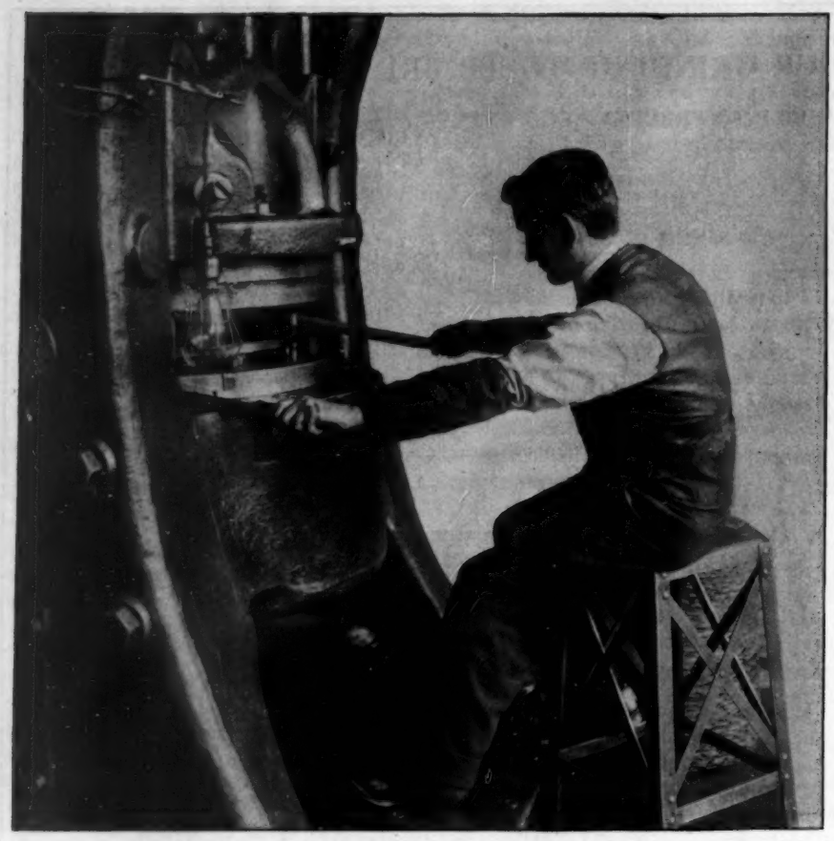


SUCTION SAFETY DEVICE FOR PUNCH PRESSES

Suction Safety Device

For some time the Westinghouse Electric & Mfg. Co., at East Pittsburgh, tried mechanical safety devices of various kinds for the punch shop, but with unsatisfactory results The operators found most of them unsuited because they tended to retard the production and consequently their earnings, while the management also objected because they afforded only partial protection, as the operator had to place his hand under the press in every instance in order to remove the scrap.

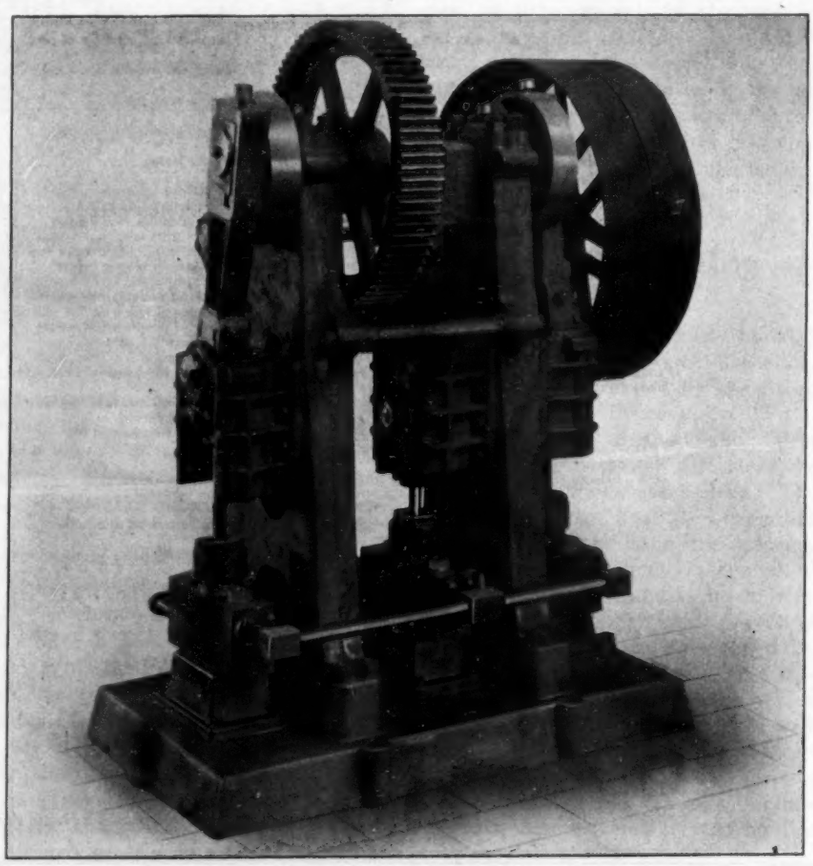
The suction device illustrated herewith was developed with the idea of preventing the necessity of the workman approaching the danger point at any time during the operation. He feeds and clears the press with the same tool. Another advantageous point is that the operator does not take hold of the material with his hands and thereby escapes the numerous small cuts to which he was subjected when inserting the blanks with his fingers. The double handle device used on large work is said to be safe because the operator is compelled to use both handles to guide the sheets properly.

Before adopting this method, a man was placed at the back of the press to feed in the sheets and he was the one who most frequently was injured because his fingers were entirely at the mercy of the operator. Since the adoption of the suction device there has not been an amputation on the large presses and up to the present time no finger has been amputated in the punch shop. This freedom from accident has been due both to the operation of the devices and to rigid enforcement of the rules by the management of the shop.

The Westinghouse Electric & Mfg. Co. also employs a number of other safety devices such as magnetic lifters, sliding devices, etc., adapted for different kinds of punchings made. The suction device operates pneumatically, the piece being drawn in place by a moving column of air.

Vertical Triplex Pump

The accompanying illustration shows a new vertical single acting, triplex hydraulic pump, designed and built by the Hydraulic Press Mfg. Co., Mt. Gilead, O. This pump is made in various sizes ranging from 8 x ⅞-inch to 12 x 5-inch, the latter figure referring to the plunger diameter and the former to the stroke. The pressure range is from 600 pounds to 16,000 pounds per square inch, depending on the size of the piston. The pumps are driven by either belt or electric motor and require from 25 to 100 horsepower, depending on the size. The effective piston speed



VERTICAL HEAVY DUTY HYDRAULIC PUMP

varies from 33 1/3 to 45 feet per minute.

The pumps are fitted with screw glands working against followers when equipped for high pressure work, or with stud glands when equipped with large pistons for low pressure work. The pistons are packed with compression packing. Forged steel is used in the construction of the high pressure pump cylinders and crank shafts. The crossheads are guided and fitted with cast iron adjusting shoes which are bored to provide a guide. The connecting rods are open-hearth cast steel, and have bronze bearings with wedge and screw adjustment at both ends.

Electric Steel Castings

BY C A HANSEN

DURING the summer of 1911 a three-phase arc furnace, having a nominal capacity of two tons per charge, was installed in a new foundry of the Treadwell Engineering Co., at Easton, Pa. The current supplied at 2,200 volts, 60 cycles, was stepped down to furnace voltage by means of two 200-kilowatt transformers connected in open delta. For the sake of greater flexibility than is ordinarily offered by alternating current motors, a small 5-kilowatt motor-generator was installed, and direct current motors were used for regulation of the electrodes. Transformers, switchboards and furnace, together with a pair of bottom-pour ladles and suitable heating rig for them, constitute the entire melting and pouring equipment. The whole occupies a floor area not exceeding 300 square feet, inclusive of working space.

No source of molten steel has been provided for the foundry other than the 2-ton electric furnace, nor has a spare furnace been found at all necessary to guard against failure of metal supply due to irregularities of operation or maintenance of the one-unit melting equipment.

The Treadwell Engineering Co. had previously operated a crucible steel castings foundry. The cost of melted metal from the electric furnace was found to be somewhat less than one-half that of the old crucible furnace plant when the latter was using oil at 2½ cents per gallon. Since the advance in the price of oil has added $6 to $7 more to the cost per ton of molten crucible steel, the possibilities of saving in costs is readily apparent.

So far as the product is concerned, the most striking differences are not found in comparing electric and crucible steels of similar compositions. If any differences exist between such steels, they are negligible in importance, as repeated tests have shown.

With the electric melting, furnace maintenance costs increase rapidly as the carbon content of the product is brought down, and, quite contrary to current opinion, it is not economical to turn out 0.10 carbon steel castings, although it is perfectly possible to do so. It is, however, economically practicable to turn out 0.20 carbon castings, and such castings can be machined easily without annealing. There is little question that all castings, whether 0.20 carbon or 0.30 carbon, can be improved by annealing, but the American attitude seems to be against the expense of annealing where annealing can be avoided.

Current opinion also has it that the advantages of the electric furnace follow largely from the fact that such a furnace can work up any sort of a charge. While this may often be true, it is not well to base estimates of the cost of molten electric furnace steel upon the usual published furnacing costs and upon the local prices of stove-scrap and similar materials.

Average number of heats per week	15
Average weight per heat, pounds	4,600
Average power consumption per 2,000 pounds, kilowatt hours	900
Average repair costs per 2,000 pounds	$2.50
Average electrode costs per 2,000 pounds	$2.50
Average weight castings made, pounds	9
Ratio of cleaned castings, risers, etc., to charged weight, per cent	92–95
Ratio of finished castings to charged weight, approx., per cent	60

The furnace lining is repaired after 35 heats.

Probably every operator of an electric steel furnace has at one time or another run off heats from charges composed of stove-scrap or its equivalent, and little need be said of the reasons for or against such a procedure.

Cupola Metal in the Electric Furnace

Many have suggested charging molten cupola metal directly into the electric furnace for refining. In several such cases of which I know, the power consumption per ton of output was greater for the cupola metal charge than for the cold scrap charge; the original cost of the cupola metal was in the neighborhood of $18 per ton, as compared with $12 per ton for the regular cold charge, and the cost of furnacing was likewise higher for the cupola metal charge. The economy incident to heating the furnace with auxiliary fuel-burning apparatus may interest those who charge molten metal into electric furnaces, but the interest attaches rather to the prevention of skulled furnace bottoms than to a direct saving in electric energy. Heating the furnace and charge to a good red heat by means of oil burners, with oil at 2½ cents per gallon, increased the cost $1 per ton over the regular practice of all-electric heating. Keeping the furnace hot over night by means of either oil or electric energy was found not to materially decrease maintenance costs, and it did increase the cost of production. These items above refer to power supply at approximately one cent per kilowatt hour.

Much stress has been laid on the economy attaching to continuous operation of the electric furnace as compared with mere day-shift operation. So far as costs go for the molten steel, it is true that continuous operation means 10 to 15 per cent saving over intermittent operation. Very little has, however, been said regarding the relative efficiencies of day and night work in the other departments of the foundry, nor has it been well impressed upon the mind of the average investigator of electric steel problems that one can easily lose many times the 10 to 15 per cent saving in molten metal costs in the decreased efficiency of the night shifts on the molding floor, cleaning room, etc.

Operates Only in the Daytime

The furnace plant has been operated on a one-heat-per-day basis, requiring 7 to 7½ hours to turn out its charge from the cold furnace. Power consumption of furnace transformer

(*Continued on page* 816*b*)

Abstract of paper presented at the annual meeting of the American Electrochemical Society, New York, April 16-18.

Papers on Management

Two papers on management and the problems of industrial efficiency were included in the program of the meeting of the National Metal Trades Association, at Worcester, this week. Brief abstracts of these contributions are printed below.

Professor Dexter S. Kimball, of Cornell University, presented a paper on the "Basic Principles of Industrial Organization", which aims to make clear the scientific foundation which underlies any successful system of management. According to Professor Kimball, the most important principles are six in number, as follows:

1. The principle of division of labor.
2. The principle of co-ordination of effort.
3. The principle of transfer of skill.
4. The relation between the unit of cost and the number of parts produced.
5. The systematic use of recorded experience.
6. The principles governing human relations.

In this connection the author states that the application of the first five principles is in all cases closely tied up with the laws governing human relations. If these relations are not harmonious, the machinery cannot operate efficiently, no matter how skillfully it is arranged.

In a former time these relations were looked upon as being entirely personal and it was supposed that personality as expressed in leadership was the one great force in controlling the relations of men to each other. It is still true and it will always remain true, that leadership is the great essential to the success of any enterprise involving human relations, but even here it has been established that by cold scientific methods some of these relations can be measured. Motion study and time study have already demonstrated that the laws of bodily effort can be fairly definitely evaluated and the careful manager, no matter how great his personality, will do well to keep in touch with the developments along this line.

A paper by George D. Babcock, production manager of the H. H. Franklin Mfg. Co., Syracuse, N. Y., described the result of a system of scientific management at the Franklin automobile plant. According to this system, the management plans for and issues all orders in complete detail. The part assemblies are equalized by direct orders of the management, no stock chasers being employed. The system is so arranged that the prime responsibility rests on the management, rather than on the foremen. Dual responsibility is avoided, as a result material shortages are small and infrequent and part shortages are never serious; the employes are better trained than formerly and there is less avoidable absence from work. It is said there has been a marked increase in the rates of pay and a marked decrease in the cost of the product.

Automatic Starters

The use of motors operating at high voltages frequently is desirable in large industrial plants, and for driving centrifugal pumps and similar machines, 1,100 and 2,200-volt squirrel cage motors are used to a considerable extent. To make the starting of these motors easy and to eliminate the danger of hand control, the Cutler-Hammer Mfg. Co., Milwaukee, has placed a new line of high tension self starters on the market. These can be automatically controlled when operating on an open tank system by means of a float switch and on a closed or compression tank system by a gage or diaphragm pressure regulator. For remote control from one or more points, control stations can be employed so that the operator need only push the button to start or stop the motor.

These controllers are of the multiple solenoid type, comprising an angle iron, floor type, self-supporting frame, which carries the high tension oil-immersed solenoid switches and necessary relays controlling the motor and auto-transformer circuits. The oil-immersed type primary and starting switches used are operated by single phase solenoids. All contacts are entirely enclosed under oil so that no live parts containing 1,100 and 2,200 volts are exposed. Low voltage current is used for the operation of the solenoid coils. The capacities of the standard types of these self starters range from 20 to 300 horsepower and are made for both 25 and 60-cycle, three-phase circuits.

The Smith Gas Power Co., Lexington, O., has received an order for the installation of a gas producer plant at the Streator, Ill., works of the American Bottle Co., Chicago. The gas is to be used for annealing lehrs and glass pots. The plant will consist of one four-section producer, which will be the first of two to be installed, and it will be equipped with a tar extractor and gas cleaning machinery. The plant will operate on Illinois bituminous coal.

Safety Hints

In a magazine published for the benefit of its employes, the Burroughs Adding Machine Co., Detroit, recently printed a comprehensive list of safety hints prepared by A. Brain, superintendent. The admonitions are as follows:

1. Treat your shopmates with courtesy and work in harmony with them.
2. Acquire habits of caution for your own protection and for that of your shopmates.
3. Use general tools with care and return them in as good condition as when taken.
4. Avoid wearing loose fitting clothing and jewelry or gloves in the hand, especially around machine tools.
5. Before throwing on power always look the machine over carefully and be certain every part is in working order.
6. Adjustments and oiling should be avoided when a machine is running.
7. Whenever possible, start a machine by hand, to be sure all moving parts are free.
8. When in doubt concerning your work or the operation of any machine, ask your foreman.
9. When operating a machine, give the work your undivided attention. It may save spoiling a job, if not more serious damage.
10. When taking charge of any equipment, examine it carefully and report any breaks or defects, otherwise you will be held responsible.
11. Never fool with a machine and avoid scuffling with shopmates during working hours.
12. Do not leave material, tools or work lying on the floor, where anyone might stumble over them, nor in overhead trestles or platforms, where they might fall or be jarred off.
13. It is extremely dangerous to set cutting tools in a moving machine.
14. Do not lounge on a moving machine and keep a respectable distance from all moving parts, especially gears and cutters.
15. When through work, clean the bench, vise or machine with brush and waste, and see that all small tools are returned and checked.
16. Before throwing in an automatic feed, be sure the stops are set so that no damage will be done either to the work or machine by its use.
17. Form the habit of never standing in line with swiftly revolving parts, such as emery wheels, pulleys, etc.
18. Practice economy in use of oil, waste, emery, files and other supplies, as careless waste of these things causes enormous losses in many shops.
19. When working around a dan-

(*Continued on page* 816*b*)

Shooting Concrete Into Place

How Heavy Foundations at New Cleveland Plant of Otis Steel Co. Are Placed With Compressed Air

AT THE Riverside plant of the Otis Steel Co., now under construction in Cleveland, a new method of mixing and placing concrete has been employed which is said to have effected a considerable saving. This method consists of mixing concrete by compressed air in a MacMichael pneumatic mixer and blowing it through an 8-inch pipe from the mixer to the forms. This system has been used in a number of other places. It was formerly used for tunnel lining exclusively, but for such work as the construction of the heavy footings and the high piers for the steel company's plant its economy also has been clearly demonstrated. The work on the Otis Steel Co.'s plant consists of some 40,000 cubic yards of concrete placed in heavy foundations and high piers, as shown in Fig. 1. These piers contain from 10 to 19 cubic yards of concrete each. To fill them a goose-neck arrangement was made as shown in the illustrations. This was moved along on rollers between two rows of piers and was so arranged that it would swing to fill four piers each time the pipe line was extended. The pipe line extended 700 or 800 feet from the mixer at the farthest point. During the month of December, 1913, before the work was shut down for the winter, the machine mixed and placed 6,500 yards. This machine was of ¼-yard capacity.

The mixer consists of a conical drum with an elbow at the bottom to which the conveyor pipe is attached, and with a hopper at the top which is closed by a door operated by an air piston. The cement, sand, stone and water are fed into the mixer through the hopper and the door is closed. The air is then turned on, entering the mixer at two points, one above the charge, and one at the heel of the elbow. The 80 pounds pressure which is used mixes the material and blows the mixed concrete out through the bottom of the cone and through the pipe to the forms. The output of the machine is dependent upon the speed of loading. The mixers are made in ¼ and ½-yard sizes and the speed of loading varies between 60 and 120 batches per hour. The provision of overhead bins makes possible a higher rate of loading which would give the ¼-yard machine a capacity of 30 yards per hour, and the ½-yard machine 60 yards. An 8-inch pipe of No. 10 gage metal or an 8-inch well casing is used for conveying the concrete. The facility with which the delivery pipe can be carried under, over or around obstructions which would make wheeling difficult, is one of the important advantages of the system.

The air required to operate the plant varies according to the distance from the mixer to the forms, the number of elbows in the line, etc. A convenient method for estimating the required capacity of the air plant is to assume 1 cubic foot of free air compressed to 80-pound pressure for each lineal foot of pipe per batch of concrete. For general concreting work a compressor of 600 cubic feet per minute capacity is probably the best size, although a 300-cubic foot machine would be large enough to use with a ¼-yard mixer and 300 feet of pipe.

FIG. 1—PLACING CONCRETE BY COMPRESSED AIR AT NEW OTIS STEEL CO. PLANT

Clogging of the pipe may occur when stones of too large size are used. It has been found that the limit in size for successful operation is about 2 inches. Where crusher-run stone is used with this machine, as it has been on three jobs, a large rock occasionally gets in an elbow and plugs it. In some cases this can be loosened by tapping the pipe while the pressure is on, but if the rock is too large or too tightly wedged it is necessary to remove the pipe and punch out the obstruction. No clogging occurs, however, when the proper size of stone is used, providing the machine is not operated with an air

pressure very much below 80 pounds. An air storage tank is usually placed close to the machine, the capacity of this tank being large enough to store sufficient air at 80 pounds pressure to discharge one load, which means 1 cubic foot of space for each 6 feet of pipe line.

Size of Piers

The Otis Steel Co. used a ¼-yard machine at Cleveland for placing the piers for its new plant. The piers range in height from 12 to 18 feet above the ground, and each contains from 10 to 19 yards of concrete.

The machine is located under bins which are kept filled by clam shell buckets operated by locomotive cranes, the distribution pipe having a total length of 750 feet. The air is furnished by an Ingersoll-Rand motor-driven compressor of 600 feet per minute capacity and the plant is operated by eight men.

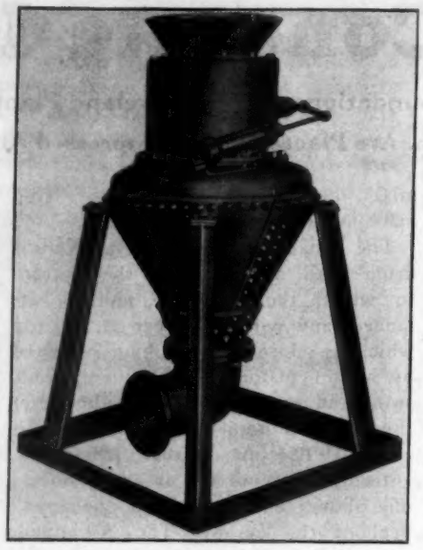


FIG. 2—PNEUMATIC CONCRETE MIXER AND CONVEYOR

Cost of the Work

The following statement of cost per cubic yard covers one week's run, during which 725 cubic yards were placed:

	Per cu. yd.
Unload'g material by locomotive crane	$0.08
Entire labor cost of mixing, conveying and placing 300 feet from machine.	0.27
Cost of air, including labor and power	0.085
Total	$0.435

The machines used at the plant of the Otis Steel Co. were furnished by the Concrete Mixing & Placing Co., 123 West Madison street, Chicago.

The first meeting of the creditors of the Lehigh Valley Structural Steel Co., Allentown, Pa., will be held at that city April 27.

How Express Orders Are Handled

BY BURTNER FLEEGER

RUSH orders always are more or less of a problem in a foundry, especially in one producing light castings in large quantities, where the number of customers is large and the castings on an individual order small, as compared with the total daily output. The castings being small, are hard to locate when they are permitted to become mixed with the general run of work, and the result is that shipments are not made promptly, frequently only a part of the order being found for the first consignment, much to the incovenience of the customer.

The case of a steel foundry operating a crucible and converter shop is typical, and the system devised to overcome these troubles proved of great advantage in gaining the good will of the customers by giving prompt and complete shipments.

The capacity of the foundry is about 200 tons per month, the class of work being unusually light, averaging less than 6 pounds. The castings range in weight from 1/10 to 200 pounds, and daily shipments of over 2,500 castings, to 30 or 40 different customers, is a regular occurrence.

The Old System

Only foreign labor is employed, very few of the men being able to speak or understand English. The molds formerly were poured off every 30 minutes by a separate pouring gang, the castings having been gathered immediately in wheelbarrows by the floor cleaning men and were dumped in a large space on the cleaning room floor to be sand-blasted by the night crew, who piled them indiscriminately for grinding. The next day the sprues were cut off and the castings finished on grinding wheels; they were then dumped near the annealing oven, as practically all castings were annealed.

As a result, it was quite an undertaking to locate express orders for a few castings, especially if the cast parts became mixed with the general run of work and it was generally necessary for someone to follow the castings through from start to finish, an expensive as well as an inconvenient method of insuring prompt shipments.

The New System

The system devised to remedy this is simple, simplicity being essential on account of the foreign labor employed, while the cost of handling the orders was no greater than that of the ordinary run of work.

When an express order is received, a molding card of a different color than for the regular run of work is filled out. When the molder receives the pattern and molding card, he also is given a square piece of red cardboard for every mold necessary to complete the shipment. As the molds are finished and placed ready for pouring, the molder nails a piece of cardboard to each mold where it will be conspicuous, but will not be destroyed in pouring.

The pouring gang is instructed to pour all marked molds first and the foreman of the floor-cleaning gang impressed on his men the necessity of shaking-out marked molds immediately, placing the castings in a wheelbarrow separate from those poured in unmarked molds.

Prompt Service

Two small spaces are marked off on the cleaning room floor, convenient to the sand blast room, and in one of these spaces nothing but rush castings is permitted to be dumped. The castings in the marked space then are sand-blasted separately from the regular run of work, and afterwards are placed in the other marked space by the sand blast operator. They are next delivered to one grinder, who finishes all rush jobs, and after grinding are placed in a wheelbarrow and delivered directly to the shipping clerk.

The men quickly *caught-on* to the system and it required little added effort on the part of the laborers to rush the castings through and to keep them separate from other orders. The rush jobs thus proceed automatically to the shipping clerk in unusually quick time, with no necessity for someone from the office to stand over them from start to finish.

The customer who receives this kind of prompt service from a foundry on his rush orders, usually shows his appreciation by placing the large, profitable orders in the same place, and the foundryman is always well repaid for his efforts along this line.

Heavy Losses Are Sustained

In Sellings Disclosed at Meeting of American Pig Iron Association—Spirit of Hearty Co-operation Displayed—The Croxton Method Approved

A dismal picture of present conditions in the pig iron trade, was painted in the addresses and private expressions of opinion given by producers in attendance upon the first general meeting of the American Pig Iron Association, held at the Waldorf-Astoria, New York City, Thursday, April 23. According to carefully-compiled averages of individual furnace costs and of selling and shipping prices, and with fair allowances for each item of manufacture, it was shown in the reports of the officers that practically every ton of merchant pig iron now being produced north of the Ohio river is being marketed at a loss to the makers. Some of the largest and most prominent producers declared that they never had seen in their experience of 40 years, such complete stagnation of the market as now exists.

Despite the poor showing of the industry at the present time, a conviction existed that current conditions cannot continue indefinitely. The keynote of the meeting was that in greater co-operation and in a more mutual understanding of producers along proper and justifiable lines, could be found effective means for insuring stability and strength where widespread idleness of capacity, economic waste and, in cases, genuine disaster, now prevail. The effort to re-establish normal conditions of manufacture in the pig iron industry, it was maintained, was calculated to serve equally the best interests of producers, consumers and employes.

Large Attendance

About 60 makers of pig iron, largely from districts north of the Ohio river, were in attendance. Morning and afternoon sessions were held and various subjects pertaining to operating and selling practice were discussed. Among such matters considered, were uniform methods for figuring costs and developing standards of efficiency, uniform contracts of sale and similar questions. Special attention was given to the adoption of a uniform contract to be used by buyers and sellers that would eliminate many differences of opinion that have heretofore existed. Much consideration was devoted to welfare work among blast furnace employes. The continuation of the use of the Croxton efficiency system in developing statistics was approved.

It was decided that the general meetings of the association should be held semi-annually.

President J. G. Butler, of the association, in his annual address, spoke as follows:

"It has been my ambition for nearly a quarter of a century that an association of merchant pig iron manufacturers, national in its character, should be formed. Various attempts have been made to bring this about, but up to the present time all such efforts have failed.

"The Bessemer Pig Iron Association, with which I was connected for a period of seventeen years, was dissolved about two years ago, because of the fact that the furnaces comprising the association had gradually either been absorbed by existing steel plants or the companies owning the furnaces had built steel plants, thus making a market for their product. When the Bessemer association went out of existence, one of the gentlemen connected therewith, largely interested in the iron and steel business, said to me that he hoped I would succeed in forming an association which would take in the entire merchant blast furnace industry of the United States; and I may say that it was largely the result of this talk that has brought about the present association, which was formed in the city of New York on Jan. 8, 1914.

"I may be pardoned if I say that in the short time since the organization was formed, no similar organization in the country can show an equal record of growth, as far as membership is concerned; and I doubt whether any association has accomplished as much in bringing together an equally large percentage of those engaged in any one industry in as short a period of time.

"From the nature of the business, there has existed always a great need for an organization of this character, and none has previously existed. To this last may be traced many of the evil conditions under which the industry has always suffered and is still suffering. We have enrolled to date 69 members, controlling 143 blast furnaces. This number represents more than 90 per cent of the merchant blast furnace capacity north of the Ohio river.

"While much has been gained for all of us by the interchange of individual experiences concerning the problems that confront the manufacturer of pig iron of all grades, I think, all here will agree that it remained for one of our members, D. T. Croxton, a practical blast furnace man, to evolve a method whereby, without any one divulging the details of his own individual business, all have had an opportunity to know the exact conditions under which the industry was operated in each of the six districts into which the country naturally divides itself. Too much cannot be said for the excellence of his system and the extent to which it is bringing us all face to face with the deplorable conditions under which we have been trying to do our business, confronted on the one hand with the great hitherto unsolved problem of taking care of our ore account when there is no market for pig iron, and on the other with the problem of how to conduct our business so that no loss may be sustained and the way pointed out for making a reasonable profit.

Safeguarding Employes

"I commend, for your consideration, this subject and shall suggest its being discussed during our deliberations and if the thought meets with your approval, will recommend the appointment of a committee to make a report before we adjourn as to the propriety of continuing to bring out at each session of the various districts, for the time being at least, the results that apparently cannot be secured in any other way and which are certainly operating to increase the knowledge we all have of existing conditions and improve our efficiency in overcoming the difficulties which so constantly confront us.

"Another matter which—it is proper—should come before us at this time is the consideration of the great question of not only safe-guarding our employes from danger, but doing all in our power to render more satisfactory the conditions under which they work. This is now everywhere being considered desirable not only from a business standpoint, but it is a duty we owe ourselves as well as those who work for us.

"No industry in the country more quickly feels the impetus of good business conditions, and none is so quickly influenced by adverse circum-

stances. And, while it is a subject that I do not desire to discuss at length at this time, I believe that the recently passed tariff was of necessity formulated by men who from the very nature of their occupation were naturally uninformed in many ways concerning the important questions passed upon by them, and I feel justified in urging you to consider the advisability of requesting that our national congress shall, before its adjournment, adopt such provisions as will lead to the appointment of a non-partisan tariff commission that shall at an early date give consideration not only to all of the more important sections of this measure, but especially to the iron and steel schedules with the purpose of not only rectifying any existing inequalities, but that it shall put to rest any unjust criticisms if existing tariffs are found to be fair and equitable.

"As long as our tariffs are largely the work of political parties or partisan organizations, they are going to be an issue, and our people can well afford to know the exact facts, no matter what the expense, and insist that when these are gathered scientifically by men free from partisan bias, our national legislature shall listen and act in harmony with the recommendations made.

Use of Uniform Contract

"In no one respect could we demonstrate this association's power for good more than by the adoption of a uniform form of contract to be used by all of our members and customers alike and which should contain all the necessary provisions to protect seller and buyer irrespective of grade, analysis, time of delivery, terms of payment, etc. There is no reason why one customer should not receive the same treatment as another, when it comes to the terms and conditions of sale. There should be no discrimination, and while the customer may always ask for a concession, he is invariably easily satisfied if he has a feeling that he is being accorded the same treatment as others in the same line of business. These and other subjects will be brought before you for your consideration. I am confident that your deliberations will be productive of great good to an industry whose prosperity is most intimately entwined with that of our country.

'I do desire to urge, however, that in all things we be entirely frank with each other in every way and that we remember that this is an age of co-operation and without desire or intent to do other than observe all the laws of the land, we can easily and strictly within our rights, at all times exchange much information concerning our costs and production, etc., in a way that will be mutually interesting and very helpful.

"And we should remember always that in all our efforts we must not overlook every opportunity to increase the value of the service we are rendering our customers, and by doing all in our power to standardize and improve the quality of our material and prevent the consumer from needless loss and embarassment, we are only going to, in the long run, do ourselves a service and bring to this association a measure of respect and confidence that may be its most valuable asset."

Secretary John A. Penton, in his report, graphically sketched the present unfortunate condition of the merchant pig iron industry of the country, and presented figures to show the average and aggregate loss of the furnaces from recent operations.

Report of the Secretary

It has been suggested by our president that it might be well for the secretary to submit to the members of our association a brief review of the effort of his office during the months of January, February and March, and that this report should also analyze in some measure the statistics that have been gathered during that period.

As is generally understood, some time and effort had to be devoted during these initial months to the matter of completing our organization, and this has happily been so far done that practically the entire industry operating north of the Ohio river is here represented with but few scattering exceptions.

The meetings of the different districts have been uniformly well attended and a maximum measure of interest taken in all our proceedings. This has, of course, as we all know, centered mainly about the method devised by Mr. Croxton for assembling accurate data covering the matter of costs and prices on the one hand, and with reference to stocks, shipments, orders, etc., on the other.

This system, impossible of conception by other than some one of wide practical experience, possessing the greatest possible familiarity with all details of furnace operation and management, has been thus far the main inspiration of the association's activities and has brought home to each member a degree of knowledge concerning the situation in each particular district that no one anticipated. This has been gradually improved and amended from time to time until we are now able by its use to determine accurately many things concerning the dismal conditions of the industry in each producing district that it might really honestly be said had not in many respects been previously even suspected.

While realizing his own unfortunate condition always, each individual member imagined, in a large measure, that his situation, for some particular reason or set of reasons, was peculiar to himself. He did not appreciate that during the nervous struggle he was making to keep himself afloat and his plant in operation, sometimes at a very great loss and with a serious impairment to his capital account, that his competitors were all doing practically the same thing, until through this system, which has brought together and consolidated into one exact set of figures the costs, selling prices, production, stocks on hand, etc., of all of our members all over the country, taken right from their books, we have been confronted with the exact truth that this great industry representing over a hundred million of dollars investment, giving employment to a great many thousand people— in a measure the cornerstone of the iron, steel and general manufacturing business of the nation, has for some time been losing vast sums of its stockholders' money.

The Conclusions

Grouping all of the figures gathered by the accountants who had charge of the system in each plant, into one unit, and taking the last month for which all the data have been compiled namely, February of this year, we find as follows:

First: That the average loss per ton on all pig iron sold by our members representing for that month above 85 per cent of the merchant pig iron made north of the Ohio river, was $1.15 per ton.

Second: That the total production of our members during February was 437,603 tons, which means a total loss on sales for February of $503,243.45.

Third: That the average loss to all of the members for that month on iron shipped was exactly 95 cents per ton.

Fourth: That the total iron shipped by all of the members during that month was 338,223 tons, which means a total loss on shipments for February of $321,311.85.

Fifth: That the average loss on unfilled orders upon the books of all the members March 1, was exactly 73 cents per ton.

Sixth: That the unfilled orders amounted to 1,714,801 tons, which

means a loss upon the unfilled orders on the books of the members March 1, of $1,251,804.73.

There is a common illusion in the minds of some people in America, the most of whom, however, have not had any real experience, either as owners, operators or dealers in pig iron, that any affiliation with this industry was certain to be successful, but the records of furnaces that are shut down, the number of receiverships that have been appointed, and the monetary loss that all are enduring have had the effect of bringing home to us all the realization that a continuance of the conditions that have hitherto existed and that do now exist in the business world and in this industry, can only bring to us a period of sad disaster.

Economies Practiced

As an evidence of the effect of the severe economies practiced by those who have had the management of the furnaces owned by our members and as an evidence that the data submitted of the costs of our product can be more than substantiated, in this connection, the liberty is taken of submitting for your consideration part three of the Report of the Commissioner of Corporations on the Steel Industry, submitted by Secretary Redfield to President Wilson, May 6, 1913.

By referring to page 87 and pages 541 to 566 inclusive, it will be seen that this volume shows positively and definitely, especially in the facts summarized in the latter part, that the average production cost of Bessemer and basic iron in the entire country in the plants represented by this association was $14.16 per ton during the years 1902 to 1906 inclusive. This figure did not at any time include selling costs and likewise was exclusive of profit upon investment, operation or interest.

There is not a man in the room or a pig iron manufacturer in America who will not agree that the cost of production in 1913 and 1914 in this country has been at least a dollar a ton more than it was in 1902 to 1906, as the result of increased cost of labor, fuel, ore, liability insurance and many other items entering into our costs at this time, and this would bring our minimum cost at present to at least $15,000 per ton for Bessemer and if after that, we were to add as a very reasonable profit $1 a ton, the price at which our product should be sold (and a price to which no fair-minded consumer would object) would be at least an average of $16,000 per ton at the furnace for Bessemer iron. And yet the average actual selling price of all iron sold by all of our members reporting during the month of February was $13.30 per ton, or a figure that was 86 cents per ton less than the average bare cost of furnace production according to government experts during the years 1902 to 1906 inclusive, for the grades referred to in that report, and when it was being made at a dollar per ton less than it is being made for now.

As the difference in cost between the production of Bessemer on the one hand and foundry and basic iron on the other, is about a dollar a ton and the cost of production since those years has increased as indicated, nearly a dollar a ton likewise, it is not unfair in any way to use the government's figures of that date for the grades they refer to as applying to our own entire average production cost at this time.

Taking these figures, then, of that period as a basis, we would find that the 375,392 tons of iron sold by our members north of the Ohio river during January, 1914, was sold for $321,819.12 under the government's estimate of cost and exclusive of selling charges, interest charges, etc. Adding to this 86 cents per ton loss for the period referred to the usual selling cost of 35 cents per ton, we find the loss of January business alone amounted to $454,224.32.

Sacrifice of Recent Months

These figures can be multiplied and extended indefinitely by using Secretary Redfield's costs and values to demonstrate the tremendous sacrifice of raw material and capital in recent months and only the lack of data prevents the consideration of the figures showing losses upon our operation for a longer period and covering the previous months.

And now added to the fore-going is a further handicap placed upon the entire industry by a government that has made a special proclamation of its great desire to aid the American people and to make secure for all time the basis of its manufacturing interests and the prosperity of its business men.

We have now confronting us one more hardship in the shape of the knowledge that foreign countries, owing to the abolition of our tariff and because of their lower cost of production, are going to be able to ship, and are even right now shipping and arranging to ship quantities of foreign pig iron into our country when the whole industry here is operating at a loss of millions of dollars a month.

It would seem to be absolutely inconceivable that all this can be true, but every man engaged in the iron and steel business in the country knows it is true.

Is it any wonder that a large percentage of the blast furnaces operated by our members are closed down and more are closing?

Is it any wonder that some of our members have reduced, are reducing, and are contemplating reducing wages of their employes?

Is it any wonder that this business and every business in America connected with it or depending upon it is halting or has halted?

If our foreign friends can afford to ship into America when we are selling at a figure that is less than the government's own estimate of costs, who knows or who can tell what they are likely to do if the American manufacturer should ever be in a position to sell pig iron again at a profit over the charges for production?

Time only can solve the problems that confront us,—time and the application of every possible economy and comparison of results by manufacturers and a willingness to stand up close, shoulder to shoulder in defence of our industry, our stockholders, our trade and our employees and to endeavor by every possible means to prevent a continuance of the conditions that have placed such a burden upon all engaged in the business.

But out of all this some measure of comfort must come we must feel confident, and that the situation which has cast its pall over us all can continue indefinitely no one can believe. That we have tried, are trying and are going to continue to try to do our very best to reduce our costs and increase our plant and operating efficiency in every conceivable way, so as to be able to meet conditions, is of course certain, and that we somehow or other are going to succeed must be sure.

The Banquet

President Butler presided at the banquet given Thursday evening. The addresses at this function carried forward the general sentiment for better and more thorough co-operation among pig iron manufacturers. A. I. Findley, editor of *The Iron Age*, declared that some reforms in the reporting of markets by the trade press were needed, in his judgment. Capt. H. S. Chamberlain, of the Roane Iron Co., Richmond, Tenn., briefly traced the development of iron manufacture in the south, and predicted that the Birmingham district, in the future, would be the main southern source of com-

petition against northern iron. Others who spoke were W. A. Rogers, of Rogers, Brown & Co.; Leonard Peckitt, of the Empire Steel & Iron Co.; J. C. Wicks, of the Brier Hill Steel Co.; F. B. Richards, of M. A. Hanna & Co.; Hugh Kennedy, of the Rogers, Brown Iron Co.; David T. Croxton, of the Cleveland Furnace Co., and M. C. Armour, of Rogers, Brown & Co.

Heavy Structural Mill

Will Be Built as Result of Canadian Tariff Changes—Other Projects

Toronto, April 28.—The recent changes in the Canadian tariff on iron and steel manufactures are regarded as being on the whole satisfactory by the large corporations engaged in the basic branch of the industry. While some disappointment is felt over the refusal of the government to renew the bounties of pig iron and steel billets, or as an alternative to grant an additional measure of tariff protection, the imposition of a duty on wire rods, hitherto admitted free, is considered an important change for the better, and likely to give a considerable stimulus to this department, which has been for some time in a languishing condition. President J. H. Plummer, of the Dominion Steel Corporation, recently estimated that the running of the rod-making plants to full capacity, which is expected to result, will give employment to about 6,000 additional men. The clause giving the government power to increase the duty on the heavier sizes of structural steel as soon as they are satisfied that the Canadian mills are in a position to meet the demand, is also welcomed as a decided advance, the first result of which has been to encourage the Algoma Steel Corporation to proceed with its plans for the erection of a heavy structural mill of large capacity. The extension of the drawback on the duty of bituminous coal, so as to include other coke manufacturers than the proprietors of smelters, provided the output is consumed for metallurgical purposes, will have an important effect in stimulating the coke industry. The Hamilton By-Product & Coke Ovens, Ltd., has for some time had in contemplation the erection of coke ovens on an extensive scale, but the scheme has been in abeyance pending the decision of the government. It is now announced that the establishment of a plant to cost $2,000,000 will be proceeded with as soon as possible.

Some of the smaller manufacturers of finished products do not look upon the changes favorably. This is more particularly the case with the companies manufacturing nails and wire goods who have hitherto imported their raw material largely from Britain and the United States. They will now be compelled to buy their wire rods from the large Canadian concerns, which also manufacture the finished products. This they contend places them at the mercy of the big corporations and may result in some of them being unable to continue in business. A few years since, a project was on foot for the merger of a number of the wire and nail companies, and the present situation may lead to the revival of the scheme.

Manufacturers of the classes of agricultural implements, upon which the duty has been reduced by 5 per cent, including mowing machines, harvesters, self-binders and reapers, are naturally dissatisfied with a change which is calculated to increase the keenness of competition with American manufacturers, especially in the west, but they may console themselves with the reflection that in view of the strong agitation in that section for free agricultural implements, it might have been worse. In the opinion of many observers of the political situation, the worst is yet to come when the next parliament, in which the west will have a larger representation, has an opportunity to deal with the question. In the meantime, the position of the agricultural implement manufacturers is too strongly established to be seriously affected by the present change.

Defines Machine Tools.—A decision bearing upon the much-discussed question as to the scope of the term "machine tools" has been handed down by the Board of United States General Appraisers at New York City, in disposing of a number of protests from importers as to the classification for duty of a wide variety of tool-working machines. General Appraiser Fisher, writing the decision of the board, holds that only such machines as are driven by other than hand power and that work upon metal, employing in their operation cutting tools, are machine tools as that term generally has been understood.

Robert J. Forman, proprietor of the Brooklyn Iron Works, which was founded by his father, and treasurer of the New York Wire Work Manufacturers' Association, died at his home in Brooklyn, April 20, at the age of 62 years.

Makes Annual Report

The General Electric Co., Schenectady, N. Y., reports for the year ended Dec. 31 gross earnings of $11,748,327, an increase of $2,348,109 over last year. Total income was $13,057,879, equal to 13.2 per cent on the outstanding capital stock, an increase of $479,143 over 1912, when 12.4 per cent was earned. Surplus after dividends amounted to $4,908,675, the total surplus now standing $16,393,819. The income account compares as follows:

	1913.	Increase.
Sales	$106,477,438	$17,295,252
Cost sales	96,207,833	15,133,641
Profit	10,269,605	2,161,611
Int., etc.	1,478,722	186,498
Total earnings	11,748,327	2,348,109
Int. on debs.	1,007,910	475,823
Net income	10,740,417	1,872,286
Oth. income	1,281,462	40,206
Inc. of secs. val.	1,036,000	*1,433,349
Total income	13,057,879	*479,143
Dividends	8,149,204	1,936,030
Surplus	4,908,675	*1,456,887
Prev. surplus	12,031,144	*16,988,748
Total surplus	16,939,819	*18,445,635
Stock dividends		*23,354,310
Final surplus	16,393,819	4,908,675

*Decrease.

C. A. Coffin, chairman of the board of directors of the General Electric Co., Schenectady, N. Y., remarks to stockholders:

"In the year 1913 the business of your company exceeded in volume the record of any previous year.

Val. orders received	$111,819,142.00
Amount sales billed	106,477,438.76
Net results:—	
Profits from sales	$ 10,269,605.45
Income from other sources	3,796,184.43
	$ 14,065,789.88
Less int. and discount on debent. and notes payable	1,007,910.69
Dividends paid	8,149,204.55
	$ 9,157,115.24
Carried to surp. acc't	$ 4,908,674.64

"The tendency toward an increase in the number of orders and a reduction in their average value has continued during the past year, more than 600,000 orders having been received. This feature of the business, together with increased competition, has caused an unavoidable addition to the expense of securing and filling orders.

"The number of employes of your company, engaged in factories, offices and subsidiary companies, Dec. 31, 1913, exceeded 65,000."

At the meeting of the board of directors held June 13, 1913, Mr. Coffin, having served as president of the company since its organization in 1892, was elected chairman of the board. E. W. Rice Jr., the senior vice president, whose term of service has been equally lengthy, and who has had intimate familiarity with the important interests of the company, was elected to the presidency.

Worcester Meeting Big Success

Large Attendance at Convention of National Machine Tool Builders' Association —Clayton Bill is Denounced—Business Conditions Discussed

The twelfth annual convention of the National Machine Tool Builders' Association, held at the Bancroft hotel, Worcester, April 23 and 24, was the largest spring meeting ever held by that organization. Slightly less than 200 delegates were on hand at the adjournment. The convention consisted of two open sessions, Thursday morning and Friday afternoon, the rest of the time being set aside for committee meetings. At the open sessions three papers, devoted to subjects of timely interest to machine tool builders were read and discussed, and the reports of the officers were submitted as usual. In addition, two of the committees, on grinding wheels and grinding wheel safeguards, and on the standardization of grade markings on grinding wheels, rendered valuable reports.

The association originally had planned to hold this meeting in New York, as usual, but finally decided on Worcester, in order to permit members to take in the convention of the National Metal Trades Association, also held in Worcester last week, as reported in this issue of The Iron Trade Review. The selection of Worcester, as events proved, was a wise one, and a great deal of the success of the convention, especially in its social features, was attributable to the forethought and hospitality of the Worcester members.

Business Conditions

In his opening address, President W. A. Viall, on Thursday morning, commented upon the present business situation of the country, saying that members should not attempt to conceal from themselves the true state of affairs. At the same time, he advised them to maintain their confidence in the hope that the country shortly will be back in the normal condition. This quiet spell, he said, has some advantages, in that it enables machine tool manufacturers to appreciate what the real capacities of their plants and working staffs are.

Mr. Viall expressed the opinion that lower tariffs without materially decreased cost of living, and, consequently, lower wages, will not place us on even competition with foreign manufacturers on neutral grounds, and that this very apparent fact should be impressed, as much as possible, upon legislators. The government, he said, should encourage the machine tool export trade, doing some of the things for American manufacturers that foreign governments do for their manufacturers. Marked concessions in railroad rates for export, for instance, are greatly needed in order to develop our export trade. He suggested, also, that members of the association employ all possible means toward securing the equalization of patent conditions in foreign countries, in order that American manufacturers may have as great protection abroad as we grant in our country to the foreigners.

General Manager Hildreth, in his report, stated that he has called on 60 manufacturers and members since the date of the January meeting. He stated that he intends to continue to make these visits in the future. He advised delegates to stop worrying about the inactivity of business and blaming it all upon the present administration; he urged them to keep up their activity.

In the absence of Chairman G. N. Jeppson, of the committee on the standardization of grade markings on grinding wheels, his report was read by R. C. Purdy. This committee held a meeting on April 7 and agreed to recommend the adoption of uniform standards in grades as well as in sizes of grinding wheels.

Chairman R. G. Williams, of the special committee appointed to consider grinding wheels and grinding wheel safeguards, also submitted a report. The committee, he said, sees no need of recommending changes in speeds, as all manufacturers, invariably, test the wheels for given speeds and indicate these clearly in the data which accompanies the wheels. The report also recommended that the members give support, as far as possible, to the Bremner bill, now in the House of Representatives, which, if it becomes a law, will make possible the establishment of uniform standards in safety appliances, etc.

The exceedingly interesting paper by J. C. Spence, superintendent of the Norton Grinding Co., Worcester, will appear in an early issue of The Iron Trade Review.

Charles Fair, of the General Electric Co., Schenectady, N. Y., submitted an interesting paper entitled "What Features of Electric Motors Can Be Standardized for Machine Tools". Mr. Fair was of the opinion that there should be a better understanding on the part of the machine manufacturer and the motor manufacturer of each other's difficulties, and he suggested methods of standardizing motors for machine tools along lines which would be most satisfactory to both sets of manufacturers.

R. G. Williams, safety engineer of the Norton Co., Worcester, read a paper entitled "Safety as Applied to Grinding Wheels". This paper was along the same lines as the one Mr. Williams presented before the American Society of Mechanical Engineers some time ago, but included much additional data.

Plants Visited

During their stay the visiting delegates were extended the freedom of several of the most important plants in Worcester. These included the Harrington & Richardson Arms Co., the North works of the American Steel & Wire Co., the Reed-Prentice Co., the Rockwood Sprinkler Co., the Whitcomb-Blaisdell Machine Co., the Worcester Pressed Steel Co., and the Osgood Bradley Car Co. In addition, trips were made to the Boys' Trade School and the Worcester Polytechnic Institute. Friday noon the delegates, in a body, were taken to the Norton Co.'s plant and entertained at luncheon. The visiting ladies were entertained on automobile excursions to the Wayside Inn. at Sudbury, to the Girls' Trade School and to the plant of the Royal Worcester Corset Co.

The chief social feature, of course, was the "Good Fellowship Dinner", held Thursday night. Besides singing, in which the delegates joined, the main entertainment was a minstrel show given by a troupe from the Norton plant. The various members of this troupe portrayed prominent men in the machine tool trade and the dialogue contained humorous shafts at members of the audience.

Convention committees were as follows:

Resolutions Committee — Paul E. Thomas, Kempsmith Mfg. Co., Milwaukee; Geo. I. Alden, Norton Grinding Co., Worcester; Chas. E. Bilton, Standard Mfg. Co., Bridgeport.

Auditing Committee — J. J. Oliver

Bardons & Oliver, Cleveland; M. A. Coolidge, Fitchburg Machine Works, Fitchburg, Mass.; F. G. Harrison, Massillon Foundry & Machinery Co., Massillon, O.

Press Committee—President W. A. Viall, Brown & Sharpe Mfg. Co., Providence; Secretary Chas. L. Taylor, Taylor & Fenn Co., Hartford, and General Manager Chas. E. Hildreth.

Clayton Bill Denounced

A resolution, by Murray Shipley, of the Lodge & Shipley Machine Tool Co., Cincinnati, denouncing the Clayton bill now pending in Congress was adopted.

Year of Progress is Reviewed

(*Continued from page* 783)

his life's work, and that employers should co-operate with the schools to give the pupil actual shop experience in the trade he desires to learn; in case the pupil has not selected a particular vocation, he could be aided in making his choice by receiving the benefit of experience in a diversity of industries or callings. Furthermore, I believe such a system of education should by law be made compulsory throughout the country. Under such a system pre-vocational courses should be introduced for children who are not yet old enough to go to work; secondly, there should be part-time schools for children under 18, in the trade; thirdly, there should be evening vocational schools for workers who are busy during the day. Of course, the schools should not undertake to teach manual dexterity, as that is the business of the employers. The putting into general practice of such a scheme of compulsory vocational training would necessitate the development of a new type of teacher, and the payment of higher salaries than teachers receive at present."

Should be Compulsory

C. A. Prosser, secretary of the National Society for the Promotion of Industrial Education, in discussing Mr. Geier's remarks, concurred in his belief that vocational training should be made compulsory. "In Massachusetts," he said, "the state is willing to pay half the cost of operating continuation, or part-time, schools, yet not 150 boys and girls in this state are receiving the benefit of such an education. The explanation is that it is not compulsory."

Mr. Prosser stated that the National Society for the Promotion of Industrial Education during the past year has written the vocational educational laws for eight different commonwealths, and that in the near future it will write them for six more. He described the work of the national commission on industrial education, of which he is a member, saying that the commission will report to Congress by June 1. He urged that the association delegate one of its members to appear before the commission in order to make suggestions as to methods for furthering the cause of industrial education.

At the close of the discussion, Mr. Geier introduced this resolution, which was unanimously adopted:

"Resolved, that this association co-operate with other associations in advancing the cause of industrial education, and that $1,000 be appropriated for this purpose."

R. H. JEFFREY,
Of the Jeffrey Mfg. Co., Columbus, O., Councilor National Metal Trades Association

An interesting paper was submitted by Louis H. Buckley, president of the board of trustees of the Worcester Trade School for Boys, who described the system of vocational training which has been in effect at this school since it was opened to pupils Feb. 9, 1910. The day pupils, about 400 in number at the present time, are taught the trades of patternmaker, machinist, cabinet maker, carpenter, power plant operator, draftsman, both mechanical and for the building trades, and printing, all the courses being four years. In addition, nearly 800 men are in the evening classes. These men are employed in the local industries and come to school in the evening to get further practical training in their trades.

The regular schedule of the school is to send its pupils into its shops for a full week and the next week into its school rooms. For the courses, the boys are divided into two divisions which alternate in the shops and school rooms. The school also is open to pupils on the half-time plan; the half-time pupils take exactly the same course as the full time pupils, except that they work in outside shops, which pay them apprentice wages, to get their shop training. The school also conducts a continuation course for apprentices, who are given instructions on Saturday mornings from 8 to 12 o'clock. The only requisite for the admission of apprentices to this class is that they must be vouched for by their employers.

The teachers in this school are of an unusual type, being known in the shops of the locality as leaders in their respective trades; hence the pupils receive a training which is unique in the thoroughness of its character. Twenty-six boys, the first class, were graduated in June, 1913. They were immediately placed at an average wage of $2.25 a day, many of them in shops where they had worked during their course.

The Fitchburg Plan

W. B. Hunter, of Fitchburg, Mass., presented a description of the Fitchburg plan of co-operative education. This is fashioned after the plan adopted by the University of Cincinnati, under Prof. Herman Schneider, and was inaugurated six years ago by members of the Worcester branch of the National Metal Trades Association who are located in Fitchburg. The leader in this movement was the late Daniel Simonds, of Fitchburg, who was actuated by an address by Prof. Schneider before the annual convention of the National Metal Trades Association in 1908. Consequently, Prof. Hunter's address was of more than usual interest to the members of the association.

The Fitchburg plan, said Prof. Hunter, provides an opportunity for learning a trade and obtaining an education at the same time, by enabling the pupils to spend alternate weeks in the shops of the city and the high school, as apprentices in the following trades: Machinist, patternmaking, saw-making, drafting, iron molding, tinsmithing, piping, printing, textile and office work. The plants at which the shop experience is acquired are the Bath Grinder Co., Blake Pump &

Condenser Co., Brown Engine Co., C. H. Cowdrey Machine Works, H. M. Downs Printing Co., L. H. Goodnow Iron Foundry, Jennison Co., Fitchburg Machine Works, Fitchburg Steam Engine Co., Grant Yarn Co., G. M. Parks Co., Parkhill Mfg. Co., Putnam Machine Works, and the Simonds Mfg. Co. The course is of four years' duration. The first year the pupil spends wholly in the school. A trial period of two months, beginning at the end of the first school year, is given each candidate to see if he is adapted to the particular trade he selects, and his parents then sign an agreement whereby the apprentice promises to complete the full course, and the manufacturer promises to teach him the rudiments of the trade as designated in the agreement. Wages are paid for shop work at the following rates: First year, 10 cents an hour; second year, 11 cents an hour; third year, 12½ cents an hour; thus making a total of approximately $550 for the three years of shop work. The object of the Fitchburg plan, said Prof. Hunter, is to care for the needs of the mechanic, and to furnish him with such an equipment that he is a bread winner on graduation.

W. H. Van DerVoort, chairman of the committee on the prevention of industrial accidents, announced that work in furthering safety and sanitation has been pushed by the association and its members during the year with very satisfactory results. He further stated that it is easier now than in times past to enlist the cooperation of the workmen. At this point, it was announced that the new chairman of the administrative council of the association would be permitted to participate with other organizations for the purpose of cooperating in the safety work being done throughout the country.

M. W. Alexander, of the General Electric Co., West Lynn, Mass., in an inspiring manner related his recent efforts in behalf of safety and sanitation work. He told of the meeting at Buffalo, on March 23, of the conference board on safety and sanitation, made up of the president and one member each of the National Founders' Association, the American Foundrymen's Association, the National Association of Manufacturers, the National Electric Light Association and the National Metal Trades Association. This board, he said, will hold another meeting in a few weeks, and it will endeavor to standardize safety appliances as much as possible, and that efforts will be made to decide on the "one best way" to handle all problems that arise in safety and sanitation work. He recommended that whatever is recommended by the board should be received by the various associations as being the result of most careful study and scrutiny, and the best the board has to offer.

Mr. Alexander said that while there must be one best way in which to handle accident prevention and accident insurance, there must also be a best way in which to handle each kind of an accident, for accidents are always bound to happen, even if they are reduced in number, he said. To the end that the one best method of treating each kind of an accident might be determined, said Mr. Alexander, he called a meeting of 15 physicians on April 4, who represented 15 large industrial plants.

"The task I submitted to them,"

P. O. GEIER,
Of the Cincinnati Milling Machine Co., Cincinnati, Councilor, National Metal Trades Association

continued Mr. Alexander, "was to take up the various accidents which occur in industrial plants and to decide on the one best way to treat each one of them, in order that the injured workman may be restored to his health and working capacity as fully and as speedily as possible. In short, I wanted them to determine the rule to be followed for each kind of an accident, to get the best results. It is said that it is impossible to get two doctors to agree, but the agreements which were reached by these physicians exceeded even my fondest expectations. These physicians will hold another meeting shortly for the purpose of completing the work which they began in such a promising manner."

Mr. Alexander declared that the general adoption of workmen's compensation legislation must necessarily bring about the development of a system whereby all manufacturers will keep track of the physicial condition of their men; new men will be examined on going to work, and old men will be given an examination periodically. While a man should not be rejected for physical defects, said Mr. Alexander, such an examination will make it possible to select for him work in which his defects will not lower his efficiency. The physicians alluded to above, said Mr. Alexander, now are working in committee on a classification of the various kinds of ailments and physical defects, together with data indicating the kind of work which may be done by men thus afflicted, without impairment of their usefulness.

Mr. Alexander said it is a cause of gratification to see how widely the "Safety First" slogan has been adopted throughout the country. Signs bearing these words, he said, are found in a large percentage of the plants; in some of these establishments, however, the safety work begins and ends with the slogan. This, perhaps, is because the management of such establishments have not yet discovered that the "Safety first" campaign is to their own interest as much as to the interests of the employes. He is advised the members to engage earnestly in safety and sanitation work at their respective plants, since they would find it to be to their advantage economically.

"I used to appeal to the manufacturers in the name of humanity," said Mr. Alexander. "Now I appeal on the ground that efforts to safeguard their workmen will be financially profitable to them. I find that brings better results."

Safety Campaign

William H. Doolittle, safety inspector of the National Metal Trades Association, reported that the campaign which has been carried on by the association for the prevention of industrial accidents has been very successful, and that the number and seriousness of accidents have been greatly reduced. During the past year, inspections have been made of 334 plants, located in 96 cities, distributed over 14 states and a part of Canada. In each case, a report covering the inspection has been made to the interested member, together with such suggestions for betterment as were deemed practicable and helpful, and at least 95 per cent of these suggestions were favorably received and acted upon. Illustrated lectures have

been given under the auspices of the association in nine cities, the attendance ranging from 400 to 800. Mr. Doolittle stated that it is difficult to make comparisons in the numbers of accidents in various years because no accurate records have been kept. He suggested that each manufacturer keep a record of all accidents which occur at his plant and he set forth a classification of accidents which he recommended for use in compiling such records. Mr. Doolittle also suggested methods by which employers can secure the co-operation of their employes in extending safety appliances.

Theodore O. Vilter, of the Vilter Mfg. Co., Milwaukee, in discussing Mr. Doolittle's report, said that the safety work at his plant is under the supervision of an executive committee composed of the superintendent of the plant and the foremen of the various departments. The workmen in each department are invited to drop suggestions regarding safety appliances into a box provided for this purpose, and once a month the executive committee meets to discuss these suggestions. On one occasion, said Mr. Vilter, there were 98 suggestions in the box, and of these 94 were acted upon favorably by the committee. This, Mr. Vilter thought, proved that the problem of securing the co-operation of the men at his plant has been solved effectually.

President Layman said the employes at his plant, the Wagner Electric Mfg. Co., St. Louis, are so much interested in the advancement of safety and sanitation work that they recently sent him a written communication requesting that the company publish a safety bulletin.

Mr. Babcock's Paper

An exceedingly interesting paper on Wednesday was that of George DeA. Babcock, production manager of the H. H. Franklin Mfg. Co., Syracuse, N. Y. Mr. Babcock reserved no details in describing the method of scientific management which he has installed at the Franklin plant. The results of this system were set forth by him, at the conclusion of his paper, in the following summary: Single responsibility has brought rapid decision; faults are few and causes are exactly determined; there is no indefiniteness with respect to any element of effort in the plant; dates planned for are almost exactly met in a large percentage of events, while if failure to keep dates is imminent, all available help can be concentrated at once on the weakness to make a rapid correction; time study has been of great value to ensure dates, even more than it has in application to working costs; material shortages are small and infrequent; part shortages are infrequent and never serious; tools and machines in first-class condition and especially selected for the required task; high and practically constant percentage of preparation to operating time; employes are much better trained and show less avoidable absence; practically no peak load of effort and consequently little change in numbers of employes; marked increase in rates of earning;marked decrease in cost of comparative product; results accounted for entirely by the management.

Another paper devoted to the subject of industrial education was that of Prof. Dexter S. Kimball, of Sibley college, Cornell university. Prof. Kimball explained the six basic principles which, he said, underlie all industrial organization. First, there is the principle of division of labor, second, the principle of co-ordination of effort; third, the principle of the transfer of skill; fourth, the relation between the unit cost and the number of parts produced; fifth, the systematic use of recorded experience; sixth, the principles governing human relations. All so-called modern efficiency systems, said Prof. Kimball, are based upon these principles, so far at least as the abstract, economics of production are concerned.

Work

Alberius H. Baldwin, chief of the bureau of foreign and domestic commerce, of the department of commerce, Washington, said that Secretary Redfield had expected to be present, but found it impossible to come. As a message from the secretary of commerce, Mr. Baldwin said the former had expressed his desire to encourage as much as possible the work of progressive organizations, such as the National Metal Trades Association.

Mr. Baldwin said that the activities of the government evidently have seemed to manufacturers and business men to be of a restrictive and regulative character entirely, and it was therefore a pleasure for him to be associated with a branch of the government that was not of such a character. Mr. Baldwin described the work of the bureau of foreign and domestic commerce as being the collection of trade information which is of use to American merchants and manufacturers of all kinds. For news from abroad, he said, the bureau relies on the reports of consular officers who write the current trade history of their respective localities; these men, he said, are of more than usual ability, and they report everything which may lead to the sale of American products abroad. The bureau, he said, has translators and an editorial staff which disseminates this information in the form of daily reports. The bureau plans to extend its efforts by establishing men in 14 foreign cities; it also plans to locate men in the large cities of this country who will write the local trade history. He said, however, that the bureau does not appear to have the co-operation of manufacturers and that he feels as though he were working in a sort of vacuum. He asked that manufacturers manifest more interest in the efforts of the bureau.

Some Ohio Legislation

The remarkable paper on "Labor Legislation," which was presented by Walter Gordon Merritt, president of the American Anti-Boycott Association, was published in THE IRON TRADE REVIEW of April 23. Mr. Merritt's paper was followed by an equally able address by B. B. Tuttle, who is counsel for the Cincinnati branch of the National Metal Trades Association. Mr. Tuttle confined his remarks to the recent changes in the constitution of the state of Ohio, whereby it became possible to put into effect laws which before would have been unconstitutional. He mentioned as a typical example the so-called "anti-screen law," which forces mine operators to pay miners on a tonnage basis calculated on the weight of the coal before it has been screened for the market. He said that a mass of other legislation of a similar nature has been put through by the Ohio legislature since the constitution was amended.

"I take this opportunity to tell you about Ohio, gentlemen, because I feel sure that what we are experiencing there you also will be called upon to experience in the near future, for Ohio has always been looked upon as a conservative state, and if this is possible in a conservative state, I hesitate to think what will happen in the radical states. I tell you this as a warning; the manufacturers in Ohio could have prevented these amendments if they had realized the seriousness of the situation before it was too late, and you probably can do much to prevent such a condition in your states if you go at it earnestly.

"I believe," continued Mr. Tuttle, "that business and politics cannot be disassociated. As long as business men are too busy to take an interest in politics, and to work toward putting

good men in public offices, just so long will employers be confronted with such conditions as now exist in Ohio."

In discussion of Mr. Merritt's paper, Henry D. Sharpe, of the Brown & Sharpe Mfg. Co., wanted to know when a strike may be considered as legally ended. He wanted to know, if the shop were operating with new men, while the old men were still out, whether the strike could be considered as over according to law. Mr. Merritt replied that there was no doubt in his mind that when the shop is operating again the strike is legally dead, and that this view would be upheld by the courts in any state in which the law on this matter is not specific.

A resolution of protest against the trend of recent legislation, and protesting especially against the so-called "Clayton" bill, now in the House of Representatives, was introduced Wednesday morning by Chairman Covell, of the resolutions committee. This resolution was adopted unanimously. A feature which aroused a good deal of laughter was a suggestion by A. B. See, the Jersey City elevator manufacturer, that there be coupled with this resolution a request for the immediate adjournment of congress.

The New Officers

Herbert H. Rice, of the Waverley Co., Indianapolis, is the new president of the National Metal Trades Association, thus succeeding Mr. Layman. Ordinarily Mr. Rice, who occupied the office of second vice president, would have become first vice president, while L. H. Kittredge, of the Peerless Motor Car Co., Cleveland, first vice president, would have been named for the presidency. Mr. Kittredge, however, declined the nomination on the ground that he would not have time to discharge the duties of this office.

In presenting the report of the nominating committee, Chairman Justus H. Schwacke said that Mr. Rice first came under the notice of the older members of the association at the Boston convention. "At that time," said Mr. Schwacke, "some of us formed the opinion that he would one day be one of the leaders of this organization and it is therefore all the more gratifying to name him for the presidency."

The new officers were elected unanimously. In addition to Mr. Rice, they include: First vice president, L. H. Kittredge, of the Peerless Motor Car Co., Cleveland, reelected; second vice president, George Mesta, of the Mesta Machine Co., Pittsburgh; treasurer, F. C. Caldwell, of H. W. Caldwell & Son Co., Chicago, reelected.

The new councillors are: For the second district, Charles D. Whitney, of the Whitney Mfg. Co., Hartford, Conn.; for the third district, H. N. Covell, of the Lidgerwood Mfg. Co., Brooklyn, N. Y.; for the sixth district, H. D. Wilson, of the Wilson-Snyder Mfg. Co., Pittsburgh; seventh district, P. O. Geier, of the Cincinnati Milling Machine Co., Cincinnati; eighth district, R. H. Jeffrey, of the Jeffrey Mfg. Co., Columbus; tenth district, F. F. Beall, of the Packard Motor Car Co., Detroit. M. H. Barker, of the American Tool & Machine Co., Boston, was reelected honorary councillor.

Mr. Rice was escorted to the chair by Past Presidents Sharpe and Barker, and made a brief speech, expressing his appreciation of the honor which had been done him. Following the induction into office of the new president, the convention extended to the retiring president a formal vote of thanks for his work during the past year.

F. F. BEALL,
Of the Packard Motor Car Co., Detroit, Councilor National Metal Trades Association

Trips of Inspection

Tuesday morning was set aside for automobile trips to important industrial establishments in Worcester. One party visited the South Works of the American Steel & Wire Co., the largest plant of its kind in the country. Here the visitors were shown through the plant by Supt. John F. Tinsley. The second party went to Greendale to inspect the splendid plants in that part of Worcester. These include the Norton Co., Norton Grinding Co., Heald Machine Co., Osgood Bradley Car Co., and the Worcester Pressed Steel Co. Charles H. Norton, J. N. Heald and A. C. Marble escorted this party. For the visiting ladies, automobile parties were arranged by the ladies of the Worcester branch. These parties visited the local art museum, the Women's club, the plant of the Worcester Corset Co., and were entertained at the Tatnuck country club.

Loving Cup Presented

Following meetings of the executive committee and the administrative council on Monday, the annual alumni dinner was held Monday evening. On this occasion, a loving cup was presented to W. A. Layman, the retiring president. At the secretaries' breakfast Tuesday morning, all the branches with the exception of the Boston branch were represented. The secretaries' breakfast was followed by a joint meeting of the local presidents, secretaries and the administrative council. Tuesday, the Worcester branch served a buffet luncheon to the visiting delegates, and entertained them in the evening with a dinner-dance. This was concluded with a grand march, led by John W. Higgins, in which all hands joined. The dinner-dance was featured by the extemporaneous singing of some German songs by Theodore O. Vilter. The latter invited the delegates to come to Milwaukee next year and would have said more, but the audience, amid much laughter, drowned his words by singing "Sit down, you're rocking the boat." On Wednesday the association adopted a resolution thanking the Worcester branch for the splendid entertainment it had provided. A resolution was also adopted expressing entire satisfaction with the accommodations which had been provided by the hotel management.

The feeling of pride which the members of the Worcester branch take in their fine city found an outlet in the distribution to the visiting delegates of the "Worcester Book." This is a handsomely bound and illustrated volume of 324 pages which was prepared especially for the occasion by Donald Tullock, secretary of the Worcester branch. It contains discriptions of the important industries and schools in Worcester, a record of the inventions which have been contributed by Worcester to the industrial life of the country, and portraits of its prominent men, past and present. The book, indeed, is a credit to its author.

The most notable social event of

the convention was the banquet which brought it to a close on Wednesday night. This was the largest banquet ever held by the association, 256 members being seated at the tables. Theodore O. Vilter rendered his famous imitations of musical instruments of various kinds, and William Lodge led in the singing of "The Smoke Went up the Chimney Just the Same." A toast was drunk to Mr. Tulloch for his efforts in helping to make the convention a success. At 9 o'clock, Toastmaster Layman brought the fun to an end and the remainder of the evening was spent in listening to the addresses of the speakers for the occasion, Prof. J. Lawrence Laughlin, of the University of Chicago, and Dr. W. H. P. Faunce, president of Brown university.

Dr. Faunce, during his address, mentioned his visit to China last year, where he spent seven months. He told about going through a steel plant in one of the Chinese cities, in which some 3,000 workmen were employed, receiving an average daily wage equivalent to 40 cents in our money. He recommended that American manufacturers who export goods to China should bear in mind that colors have considerable significance in that country. White, for instance, denotes mourning, while red is supposed to stand for good luck. He therefore counseled manufacturers that when sending goods to china, they should employ red labels, paint and wrappers as much as possible.

Convention Committees

The personnel of the convention committees, appointed on Tuesday, was as follows:

Credentials: George D. Babcock, H. H. Franklin Mfg. Co., Syracuse, N. Y., chairman; Franklin Farrel Jr., Farrel Foundry & Machine Co., Ansonia, Conn.; Wilson P. Hunt, Moline Tool Co., Moline, Ill.

Resolutions: H. L. Covell, Lidgerwood Mfg. Co., Brooklyn, N. Y., chairman; M. B. McLauthlin, George T. McLauthlin Co., Boston; D. M. Wright, Henry & Wright Mfg. Co., Hartford, Conn.; J. W. O'Leary, A. J. O'Leary & Son Co., Chicago; A. H. Bullard, Bullard Machine Tool Co., Bridgeport, Conn.

Constitution: A. W. Beaman, of the Stockbridge Machine Co., Worcester, Mass., chairman; A. E. Norton, Reed-Prentice Co., Worcester; George M. Hendee, Hendee Mfg. Co., Springfield, Mass.

Auditing: Murray Shipley, Lodge & Shipley Machine Tool Co., Cincinnati, chairman; H. B. Kennedy, Hoggson & Pettis Mfg. Co., New Haven, Conn.; George F. Stedman, Curtis Mfg. Co., St. Louis.

Convention: Theodore O. Vilter, Vilter Mfg. Co., Milwaukee, chairman; A. J. Milne, Canadian Allis-Chalmers, Ltd., Toronto, Ont.; Paul C. DeWolf, Brown & Sharpe Mfg. Co., Providence; William Lodge, Lodge & Shipley Machine Tool Co., Cincinnati; E. E. Bartlett, Boston.

Elects New President

The Association of American Steel Manufacturers held its eighteenth annual meeting at the Hotel Schenley in Pittsburgh, April 21. The following officers were elected:

President, P. E. Carhart, inspecting engineer, Illinois Steel Co., Chicago; vice president, F. E. Abbott, inspecting engineer, Lackawanna Steel Co., Buffalo; secretary-treasurer, Frank A. Robbins Jr., The Pennsylvania Steel Co., Steelton, Pa.

The retiring president, A. A. Stevenson, of the Standard Steel Works Co., was presented a silver centerpiece filled with flowers, in appreciation of his three years' service as vice president, 1908-1911, and three subsequent years as president, 1911-1914.

Mr. Carhart, the new president, has been connected with the association almost since its inception, and has served as vice president during the past three years. The association now numbers 34 members.

Will Meet on Marquette Range

The Lake Superior Mining Institute will meet on the Marquette range during the week of Aug. 17. No definite plans have been made as yet, but it is believed one day will be spent at the mines at Ishpeming and Negaunee and the ore docks, furnaces and power plants at Marquette, and that a trip will be made to Detroit to inspect the automobile factories and other industrial plants. Committees will be appointed at an early date to make the necessary arrangements.

Form New Association

The Ironton-Ashland Manufacturers' Association has been organized by iron and steel manufacturers located near Ironton, O., and Ashland, Ky., to look after the shipping interests of its members. T. M. Adams, president of the Norton Iron Works, Inc., Ashland, has been elected president of the association, and R. D. Meacham, of the Union Furnace Co., Ironton, secretary and treasurer. I. P. Blanton, general western agent for the Carolina, Clinchfield & Ohio railroad, with offices in Cincinnati, will act in the capacity of traffic manager of the association after May 1.

Companies identified with the new organization are: The Belfont Iron Works Co., the Kelly Nail & Iron Co., the Marting Iron & Steel Co., and the Union Furnace Co., all of Ironton; the Hanging Rock Iron Co., Hanging Rock, O., and the Norton Iron Works, Inc., and the Ashland Iron & Mining Co., of Ashland.

Holds Annual Meeting

The annual meeting of the Iron and Steel Institute will be held in the new house of the Institution of Civil Engineers, Great George street, Westminster, Thursday and Friday, May 7 and 8. The retiring president, Arthur Cooper, will induct into the chair the president-elect, Adolphe Greiner. The Bessemer gold medal for 1914 will be presented to Edward Riley. The Andrew Carnegie gold medal will be presented to Thomas Swenden. The following are the list of papers which are to be presented for reading and discussion:

J. O. Arnold, D. Met., F. R. S., and G. R. Bolsover: "The Forms in Which Sulphides May Exist in Steel Ingots."

C. Benedicks, Ph.D.: "Experiments on Allotropy of Iron (Behavior of Ferro-Magnetic Mixtures; Dilatation of Pure Iron)."

A. Bose: "Recent Developments of the Iron and Steel Industry in India."

C. Chappell: "The Recrystallization of Deformed Iron."

C. A. Edwards, D. Sc. and H. C. H. Carpenter, Ph. D.: "The Hardening of Metals, With Special Reference to Iron and Its Alloys."

J. N. Friend, D. Sc. and C. W. Marshall: "Influence of Molybdenum upon the Corrodibility of Steel."

H. C. Greenwood, D. Sc.: "Note on a Curious Case of Decarburization During the Hardening of Steel Dies."

Sir Robert A. Hadfield, F. R. S., and B. Hopkinson, F. R. S.: "The Magnetic and Mechanical Properties of Manganese Steels."

H. L. Heathcote, B. Sc.: "Some Improvements in Case-Hardening Practice."

S. A. Houghton: "Failures of Heavy Boiler Shell Plates."

E. Humbert and A. Hethey, B. Sc.: "Production of Steel Direct From the Ore."

A. McCance, B. Sc.: "Theory of Hardening."

M. Misson: "The Colorimetric Estimation of Sulphur in Pig Iron and Steels by Means of Paper Impregnated With a Solution of Arsenious Anhydride in Hydrochloric Acid."

F. Muller: "The Development of Dry Cleaning in Blast Furnace Gas Purification."

W. Rosenhain, D. Sc., F. R. S., and J. L. Haughton, M. Sc.: "A New Reagent For Etching Mild Steel."

F. Schuster, D. Ing.: "Results of Talbot Process at Witkowitz."

The autumn meeting of the Iron and Steel Institute will be held in Paris, Sept. 18 to 23.

TIPS FOR NEW BUSINESS

Equipment needs of the Iron and Steel works, Machine shops, Foundries and other Metal Working plants

In New York, the situation in the local machinery market shows little change from last week and, if anything, demand again has fallen off a trifle. There was a total absence of any business of importance and no new inquiries of size have appeared and no further action has been taken on lists previously reported. Demand for second-hand machinery is not as active as it was a week or two ago.

In Pittsburgh, machine tool dealers report no change in the situation. Consumers continue to defer placing orders until the last possible moment, and are not buying beyond actual needs. The Standard Seamless Tube Co., building a new plant at Economy, Pa., has closed negotiations for five cranes and probably will place orders for additional equipment shortly. Two of the larger manufacturers of heavy rolling mill equipment are operating plants night and day, being fortunate in having had a large number of orders on their books before mill operations were reduced.

In Chicago, some signs of improvement are apparent, although the trade as a whole is not particularly stronger than has been the case for several months. One dealer notes a demand for tools from a wide range of industry, indicating better conditions in varied lines. Some dealers believe April will prove the best month so far this year, while others have not felt the impetus to the same degree. The Chicago & Western Indiana has closed for part of its list for its new shops at Clearing, Ill. The Pere Marquette has put out a list, but dealers in this market are not greatly interested. The International Harvester Co. is said to be about to make a trading proposition for some second-hand machinery now in its hospital.

In Cincinnati, the close of April shows that at least three machine tool manufacturers have done a good business during this month. The American Tool Works Co., the Cincinnati Milling Machine Co., and the Lodge & Shipley Machine Tool Co., have taken orders in satisfactory lots, and the G. A. Gray Planer Co. has also received several good contracts. The majority of machine tool makers report business very dull, and this is augmented by the lifeless condition of most of the foundries here. Second-hand machinery is quiet. Small electrical equipment and refrigerating machinery are a little better, but unsatisfactory.

EASTERN STATES

BROCTON, MASS.—Campello Machine Co. has been incorporated; $25,000; by John W. Barlow, George S. Bent, Joseph H. Borland.

FITCHBURG, MASS.—Manning, Maxwell & Moore, of New York, have taken over the Putnam Machine Co. Part of the old works will be razed and several new brick buildings built in the rear. The city council has voted $60,000 land damages to Manning, Maxwell & Moore, and when alterations and additions are done from 500 to 700 hands will be employed.

WATERTOWN, MASS.—Bids will be received until May 18, by the Watertown Arsenal, for furnishing during the year ended June 30, 1915, rope, bronze rod, bar iron and steel, nails, fuel, foundry supplies and other materials. Information furnished on application to the commanding officer, Watertown Arsenal.

WORCESTER, MASS.—The Mafreto Machine & Tool Co. has been incorporated with a capital of $25,000; by D. P. Callahan, P. A. Peterson, Worcester.

WORCESTER, MASS.—American Model & Instrument Co. has been incorporated; electrical and mechanical devices; $50,000; by Charles W. Sponsel, Isaac A. Allen Jr., and George J. Stoner, all of Hartford.

BRIDGEPORT, CONN. — The Electric Cable Mfg. Co. will build a three-story, $25,000 addition to its plant.

MERIDEN, CONN.—The Automatic Polishing Co. has been incorporated; machinery; etc.; $10,000; by Simon Kumkumian and Wilbur H. Gaines, Meriden; and Nicholas J. Downey, Wallingford.

NEW BRITAIN, CONN. — The Landers Frary & Clark Co. has purchased property on Main street upon which the Hanna Armory stands. It will tear down this structure later and build on the site.

NEW HAVEN, CONN. — The Southern New England Power Co. has been incorporated; power development; $100,000; by Edwin H. McHenry, Randall J. Everett, Fred J. Apple.

BROOKLYN.—Armour Packing Co. will erect a seven-story 40 x 85-foot plant; estimated cost, $200,000.

BUFFALO.—The Buffalo Copper & Brass Rolling Mill has increased its capital stock from $500,000 to $1,000,000.

BUFFALO.—The New York State Pneumatic Tool Co. has been incorporated with a capital of $200,000; by H. Cutting, J. D. Doster, W. Bender.

LYONS, N. Y.—Lyons Business Men's Association announces the erection of a $45,000 cold storage plant here. It will be 100 x 112 feet, with 45,000 barrel capacity.

MORTON, N. Y.—Morton Cold Storage Co. has purchased a site on which it will erect a $100,000 plant.

NEW YORK (Brooklyn). — The Franklin Brass Foundry Co., 102 Varick street, will build a 100 x 100-foot foundry.

NEW YORK (Borough of Manhattan).—Uncas Mfg. Co., 1805 First avenue, has purchased a 60 x 200-foot site for a two-story shop in Long Island City.

NEW YORK CITY.—The Comet Safety Razor Co. has been organized with a capital of $25,000; by E. H. and E. G. Fessenden, J. D. Mersereau, 352 West Forty-sixth street.

NEW YORK CITY.—C. Conner Cowplan, 68 William street, will manufacture tools and machinery; incorporated at $10,000; by W. H. Randel, H. T. Edwards, T. G. Durkan.

NEW YORK.—The Barkman-Carson Corporation has been incorporated to manufacture machinery, boilers, furnaces, etc; $300,000; by F. I. Hansell, Philadelphia; G. H. B. Martin, S. C. Seymour, Camden, N. J.

NEW YORK.—The Holland Holding Co. will erect a 12-story 55.6 x 94.9-foot factory at 223 to 237 West Thirty-sixth street to cost about $150,000; Judson S. Todd, president.

NEW YORK CITY.—The Dunlop Wire Wheel Corporation, 2130 Broadway, has leased the second floor and half the first floor of the new building of the Neptune Meter Co., 32 Crane street, Long Island City, where it is now operating with about 50 hands. It expects to make 50,000 wheels the first year.

OLEAN, N. Y.—The Carley Heater Co. has been incorporated with a capital of $75,000 to operate a machine shop and a foundry; by F. L. Gleason, C. W. Wallis, W. M. Abrams Jr.

ROCHESTER, N. Y.—The Culter Realty Co. has been granted permission to erect a power plant at Euclid and Atlas streets, to be one-story, 49 x 70; a stack 100 feet high will be built. The cost will be $14,000.

TROY, N. Y.—The Rail Joint Co. has increased its capital stock from $500,000 to $4,000,000.

WEST BRIGHTON, N. Y.—The Farrell Engineering Construction Co. has been incorporated with a capital of $10,000; by M. J. Brennan, C. V. Dandignac, M. Farrell, 313 East Sixty-ninth street, New York City.

BERWYN, PA. — American Bronze Co. will erect an addition to its plant, which will increase the capacity of the foundry 40 per cent, and of the finishing department 75 per cent.

PHILADELPHIA. — Smith Hardican Co. has secured a building permit for a $4,000 machine shop to be erected at 231 North Twenty-third street.

PHILADELPHIA.—H. G. Fetterolf plans

a carpet factory of four buildings; the main building three stories, 60 x 130 feet of reinforced concrete; the weave shed, one story, 86 x 310 feet; the service building, 28 x 49 feet; and the power house, one story, 43 x 54 feet. It is hoped to install looms by Sept. 1.

PITTSBURGH.—Standard Steel Spring Co. has been incorporated; $5,000; by J. A. Lager, L. R. Martin, P. T. Rossell, Pittsburgh.

SCHUYKILL HAVEN, PA. — Schuykill Haven Rolling Mill Co. has been incorporated with $75,000 capital stock.

NEWARK, N. J.—Work is starting on the factory for the Aluminum Goods Co. It will occupy an entire square and cost about $100,000; E. S. Fickes, Pittsburgh, architect.

WILMINGTON, DEL.—The Sanitary Specialties Co. has been incorporated with a capital of $50,000 to make machines for washing and cleansing; by W. J. Maloney, N. P. Coffin, H. E. Latter, all of this city.

WILMINGTON, DEL.—Fred A. Havens & Co., contractors, have filed plans with the building inspector for the shop to be erected for Harlan & Hollingsworth Corporation. The building will be 135 x 408 feet, of reinforced concrete with steel sash walls and reinforced cement tile roof. It will house the punch and bench shops and general offices for the ship yard.

WASHINGTON.—T. J. Cowie, navy department, will receive bids until May 5 to furnish seven tanks; schedule, 6639; to be delivered at Washington.

WASHINGTON.—T. J. Cowie, navy department, will receive bids until May 19 for a motor-driven engine lathe, double motor-driven emery grinder, motor-driven upright drill press and motor-driven column shaper; schedule, 6638; delivery to be made at Mare Island, Cal.

CENTRAL STATES

CANTON, O.—The Selas Co., of New York, manufacturer of a patent air and gas mixer on lighting and heating apparatus, is establishing a plant here. It is hoped to start operating by May 1.

CINCINNATI, O.—The Cincinnati & Indiana Railroad Construction Co. has been incorporated, the railroad company will be incorporated later; road to run from Cincinnati to Madison, Ind.

CINCINNATI. — Some additional equipment will be needed for the municipal lighting plant of Norwood, a suburb. Inquiries can be addressed to H. J. Pierson, director of public schools.

CINCINNATI. — A new $60,000 building will be erected by the Sisters of St. Joseph, at Mt. Washington. It will be three stories brick and concrete, reinforced with steel. The steel required will amount to several hundred tons.

CINCINNATI.—A fireproof school house will be constructed at Branch Hill, near Cincinnati, in the near future. Plans are being prepared by Robertson & Fahnestock, architects, of Cincinnati. The building will be of concrete construction, strongly reinforced with steel bars.

CINCINNATI.—A building 18 x 100 feet, five stories, will be erected on Walnut street near Sixth. Samuel Hannaford & Sons, architects, are preparing plans, and estimates will be taken soon. It has not been decided whether or not the building will have a framework of steel, or whether it will be constructed entirely of concrete.

CINCINNATI. — The United States Can Co., Norwood, a suburb, has let the contract for an addition to its plant through Bert Baldwin, architect, of that city. The new portion will be constructed mostly of brick, the principal steel contract being for steel windows, which was awarded to the Detroit Steel Products Co., Detroit. The same architect is preparing plans for another addition for this company, which will be 22 x 24 feet, and which will be used as a solder building.

CLEVELAND.—The Faeberhill Mfg. Co. has been incorporated; machinery; $10,000; by John Hildebrand, R. H. Hildebrand, C. M. Eberling, Joseph Lustig and O. W. Broadwell.

CLEVELAND, O.—The Cuyahoga Motor Truck Co. has been incorporated to manufacture and deal in motor trucks; $50,000; by Harry A. Clarke, L. A. Clarke, C. T. Bell, C. L. Minshall, R. H. Minshall.

DAYTON, O.—The Edgemont Machine Co. has purchased two adjoining lots to take care of future expansions.

DAYTON, O. — A movement has been started to build a central machine shop for repairing the city's motor cars including those of the fire and waterworks departments. No equipment list has been issued. Fowler Smith is the city purchasing agent.

MASSILLON, O.—The American Stamping & Enameling Co. has increased its capital stock from $1,000,000 to $3,500,000.

NILES, O.—The Metal Post & Culvert Co. has been organized with a capital stock of $20,000; it will occupy its new plant in a short time. Ex-postmaster Thomas, president; E. D. Thompson, vice president.

SPRINGFIELD, O.—The Kelly Springfield Motor Truck Co. plans to erect a 60 x 90-foot addition to its plant to be used for testing and shipping purposes.

WARREN, O.—The E. L. Iddings Co. has been incorporated to manufacture iron and steel; $2,500; E. L. Iddings, R. B. Wick and F. W. Adams.

COVINGTON, KY.—The Stewart Iron Works has been incorporated; about $1,000,000 capital; by R. S., R. C. and Chas. T. Stewart.

LOUISVILLE, KY.—The Bourbon Stockyard Co. will erect an 80 x 160-foot concrete and steel office building at Johnston and Main streets; estimated cost, $100,000.

PIKEVILLE, KY.—Call Machine & Supply Co. has been incorporated; $10,000; by J. W. Call, James R. Call and William P. Call Jr.

COLUMBUS, IND.—The present light plant is supplying electricity to the limit of its capacity now, which necessitates purchasing more equipment.

INDIANAPOLIS.—The Taylor-Evans Embossing Co. has been incorporated; $50,000; by Harry F. Taylor, A. B. Evans, C. H. Howland-Shearman.

INDIANAPOLIS.—Boston Mfg. Co. has been incorporated to manufacture locks; $10,000; by E. E. Dougherty, U. B. Boston and A. K. Stauffer.

INDIANAPOLIS.—The Weldum Products Co. has been incorporated with a capital of $10,000 to manufacture welding and cutting machines; by E. E. Davis, Indianapolis; M. B. Hood, S. T. Dewees.

INDIANAPOLIS. — Marion county commissioners are about to take bids for a bridge over White river at West Washington street, in accordance with plans prepared by County Surveyor Paul Julian; it is expected the work will cost $275,000.

SOUTH BEND. — The Engman-Matthews Range Co. has increased its capital stock from $200,000 to $300,000. The company manufactures stoves, ranges, furnaces and kindred products. The increase in capital stock has been made to enlarge the working facilities to take care of increasing business.

SOUTH CHICAGO, IND. — Fire in the main building of the Preble Machine Works, South Chicago, Ind., did damage of $50,000, with full insurance.

CHAMPAIGN, ILL.—The Neiler Rich Co., 431 South Dearborn street, Chicago, is taking bids to close May 4 on the Hamilton Hotel, $100,000, seven stories, 66 x 132 feet, of steel and reinforced concrete.

CHICAGO.—The Advance Heating Co., 105 North Clark street, has increased its capital stock from $2,500 to $10,000.

CHICAGO.—The Rene Wheel Co. has increased its capital stock from $2,500 to $12,000; directors are increased from three to six.

CHICAGO.—The Altizer Elevator Co. has been incorporated to manufacture and install elevators and hoisting machinery; $25,000; by E. G. Henderson, C. M. Cavenee and J. P.

CHICAGO.—The Wolfe Metal Specialties Co. has been incorporated; $2,500; by Ida A. Wolfe, G. B. Wolfe, 5510 Normal avenue and J. E. Fast, 5753 South Sangamon street.

CHICAGO.—The Lott Mine Equipment Co. has been incorporated to manufacture mine equipment and machinery; $15,000; by R. H. Lochner, H. A. Gardner and A. T. Carton, 76 West Monroe street.

CHICAGO. — The Great Lakes Shipping Co. has been incorporated for the purpose of marine transportation on the great lakes; $10,000; by Wm. H. Cummer, R. C. Clark, R. F. Locke, 1418 Harris Trust building.

CHICAGO. — Chas. S. Dibelka, architect, 29 South LaSalle street, has taken bids on an armory for the Second Regiment, Illinois National Guard. It will be of brick, steel and reinforced concrete.

CHICAGO.—The American Tool & Specialty Co. has been incorporated for general manufacturing in metals and other materials, specialties and machinery; $25,000; by Melvin A. Hoyt, Arthur R. Barry and Rudolph H. Liedtke, 708 Wellington avenue.

CHICAGO. — Westcott & Ronneberg, 10 South LaSalle street, are engineers for the Eighth Regiment Infantry, Illinois National Guard, and have charge of a proposed armory to cost $200,000, brick and steel, 122 x 150 feet.

CHICAGO.—Chicago Steel Copper & Zinc Co. has been incorporated to manufacture and deal in steel, copper, zinc and other metal plates; $10,000; by Harry Simonton, E. M. Williams and Vincent C. Mooney, 105 South LaSalle street.

CHICAGO. — The Moody Bible Institute of Chicago, A. F. Gaylord, business manager, 155 Institute Place, has obtained plans for an administration building to cost $400,000, seven stories, 100 x 100 feet, brick, steel and tile, requiring 1,000 tons of structural steel, including seven plate girders of 25 tons each.

EAST ST. LOUIS, ILL. — The Walls Frogless Switch Co. will establish its proposed plant here. The Walls patent includes interlocking switch stands, automatic car rerailers and steel baggage trucks.

QUINCY, ILL.—The Modern Iron Works, manufacturer of plumbing supplies, sustained about $10,000 damage by fire recently.

SPRINGFIELD, ILL.—The Detroit Pneumatic Tire Co., capitalized at $350,000, plans to establish a factory here. The enterprise involves the investment of more than $500,000; ten acres will be required.

DETROIT, MICH.—The Leonard Storage Co. has started work on two buildings that will cost $100,000. The buildings will be of steel and concrete.

MARQUETTE, MICH.—The Hegner Construction Co., Appleton, Wis., has the general contract for an orphan asylum for the Diocese of Marquette, four stories, fireproof, including structural steel and iron columns.

MUSKEEGON, MICH.—The Lakey Foundry & Machine Co. is incorporating with a capital stock of $60,000; the company will

take over the plant of the former Rodgers Iron Mfg. Co.

OWOSSO, MICH.—The American Malleable Co., a branch of the American Brake Shoe & Foundry Co., will occupy the plant recently vacated by the Reliance Motor Truck Co. The company expects to enlarge the factory and erect additional buildings; $50,000 will be spent on improvements now and $100,000 later.

CRANDON, WIS.—The county highway commission awarded contracts for four steel and concrete bridges amounting to $5,000 to the Worden-Allen Co., Milwaukee, and an $1,800 bridge to the Wausau Iron Works, Wausau, Wis.

FOND DU LAC, WIS.—The Chicago & Northwestern will build a steel bridge across East branch river.

GREEN BAY, WIS. — The Chicago & Northwestern is preparing to build a new freight depot here at a cost of $50,000. John P. Hogan is agent.

JEFFERSON, WIS.—The common council has taken the initial step to raise $40,000 for the construction of a new steel bridge over Rock river at Main street.

LACROSSE, WIS.—The Gund Mfg. Co., organized several months ago to take over the drive twist anchor patents of the defunct Vote-Berger Co., LaCrosse, will erect a new factory to cost between $12,500 and $15,000 at once.

MILWAUKEE.—The Standard Paper Co. plans a $125,000 building to be erected at Detroit street and Broadway; trial plans are on file with the building inspector.

MILWAUKEE.—Atlas Engineering Co. has been incorporated; $150,000; by Harrison S. Green, Harry E. Kjorsted, Thos. H. Sanderson Doerfler; Green & Bonder, Milwaukee, attorneys.

MILWAUKEE. — Badger Heat Treating Co. has been incorporated; $10,000; by D. J. Crowley, Oscar E. Sandberg, F. H. Corcoran; Michael Levin, Milwaukee, attourney.

MILWAUKEE. — The Koehring Machine Co., steam power concrete machinery, awarded the contract for the construction of a $12,000 shop and office addition to the Northwestern Concrete Co., Milwaukee.

MILWAUKEE.—Logemann Bros., engineers and machinists, 218 Oregon street, are about to break ground for a new machine shop at Thirty-second and Burleigh streets, to be 50 x 200 feet in size, one-story, of steel and concrete, costing $10,000. Eugene R. Liebert is architect.

MILWAUKEE.—The department of public works will call for bids about July 1 for the construction of a new drawbridge at State street. Bids will be received in two schedules, one for a single leaf bascule and the other for a two-leaf bascule. Cost, $150,000. Fred G. Simmons is commissioner.

RACINE, WIS.—Preliminary surveys are being made by the Milwaukee Light, Heat & Traction Co. for about six miles of trackage and transmission line extensions in Racine. R. B. Stearns, Milwaukee, is acting general manager.

RACINE, WIS. — Myron, Charles and Edward McAvoy, sons of the late Anthony McAvoy, Racine, Wis., founder and head of the Racine File Co. and Wisconsin Auto Top Co., Racine, have incorporated the business and plan to spend $25,000 to $35,000 in building and equipping a new workshop.

SOUTH BELOIT, WIS.—Line City Foundry Co. has been incorporated to do a general foundry business; $8,000; by A. Balderson, George Bitzer, Daniel Broadhurst.

SUPERIOR, WIS.—The state board of normal school regents has commissioned Architects Van Ryn & DeGelleke, Milwaukee, to prepare plans for a new fireproof normal school building to cost approximately $300,000, to replace the buildings destroyed by fire two weeks ago.

WAUKESHA, WIS. — The Modern Steel Structural Co., Waukesha, has received a $50,000 contract for the construction and installation of an aerial swing, 200 feet high, on the Panama-Pacific exposition grounds at San Francisco. The base will be 60 feet high and the entire swing will be electrically operated.

SUPERIOR, WIS.—The Superior Mfg. Co. will spend $10,000 on repairs to its cooper shop and dry kiln, recently damaged by fire. H. Veblen is superintendent.

DEXTER, MO.—Bids will be received until 8 p. m., May 18, by the mayor for a 10-inch deep well and pumping station, 70,000-gallon tower, six miles of four to eight-inch cast iron water pipe, 34 hydrants, and 24 valve boxes.

KANSAS CITY, MO.—The Reliance Machine Co. is reported to be preparing to rebuild its Pleasant Hill, Mo., plant, recently burned.

ST. LOUIS.—Aulogo Motor Cap Co. has been incorporated to manufacture, sell and deal in automobile caps and accessories; $25,000; by James A. Cohoun. J. F. Hilbert and Thomas H. Thatcher, of Ferguson, Mo.

ST. LOUIS.—John T. Milliken & Co., manufacturing chemists, will erect a four-story building for factory purposes, to be 130 x 272, of reinforced concrete, with metal window sash and glazed terra cotta front, at an estimated cost of $75,000. William H. Gruen, architect is taking bids on the general contract.

WEBSTER GROVES, MO.—The W. J. Frank Mfg. Co. has been incorporated to manufacture specialties made of tin, brass, copper or sheet metal; $15,000; by W. J. Frank, P. F. Frank, C. Fowlkes, Edward Luft and Earl F. Schaaf, Webster Groves.

DETROIT, MINN.—Bids will be received until 10 a. m., May 6, by M. J. Morrows, county auditor, for one carload or more of corrugated galvanized metal culverts.

SOUTHERN STATES

MONTEREY, Va.—Bids will be received until noon, May 4, by Highland county circuit court, for two steel bridges on concrete substructures; address G. P. Coleman, Richmond, Va.

NORFOLK, VA. — Southern Metal & Foundry Corporation has been incorporated; $100,000; has purchased 3-acre site and four buildings, each 3-story, 40 x 100 feet; will remodel buildings and install machinery to smelt and refine brass foundry residue, manufacture journal and engine brasses, etc.; Fred D. Miller, of Westminster, Md., is manager.

BADIN, N. C.—Southern Aluminum Co. is erecting a hydro-electric plant on the Yadkin river one and a half miles from here, and an aluminum plant here. The electric plant will develop 120,000-horsepower to manufacture 15,000 to 25,000 tons of aluminum annually. The company is controlled by French capital. W. P. Marseilles, general manager; P. Bunet, chief engineer and vice president, both of Paris.

ROCKY MOUNT, N. C.—C. H. Harris, town clerk, will receive bids until May 5 for 10 miles of four to 10-in. cast iron gas pipe.

GREENVILLE, S. C.—Greenville Iron Works has been incorporated; $10,000; by W. C. Cleveland, W. G. Sirrino.

MACON, GA.—The J. S. Morton Lumber & Timber Co. has been incorporated with a capital of $200,000 and will shortly erect a large manufacturing plant in this city

ANNISTON, ALA.—The Standard Foundry Co. announces that it will enlarge its plant one-third over its present capacity.

BATON ROUGE, LA.—Bids will be received until May 9 by police jury, F. A. Woods, secretary, for a steel bridge to be erected over Blackwater Creek.

FORT WORTH, TEX.—Fort Worth Wagon Mfg. Co. has been incorporated; $150,000; by Marion Sansom, C. Hightower, John F. Shelton and J. W. Mitchell.

SAN ANGELO, TEX.—San Angelo Ice & Power Co. will spend $12,000 to overhaul its plant and buy additional equipment.

KNOXVILLE, TENN.—Southern Locomotive Valve Gear Co. has been organized with $300,000 capital stock to manufacture the locomotive valve gear invented by William Sherman Brown. The plant will include modern machine shops, steel casting foundries and auxiliary departments; L. D. Tyson, president; W. B. Murrian, first vice-president and general manager; E. L. Cholman, second vice-president, and N. N. Boyden, secretary.

NASHVILLE, TENN.—Swift & Co. will erect a $20,000 storage house. It will be 41 x 94 feet and two stories high of brick and reinforced concrete.

WESTERN STATES

BAYARD, NEB.—Citizens voted April 8 for a $12,000 bond issue for water works improvements.

BUTTE CITY, MONT.—A bridge of steel with cement abutments will be erected over Big Hole river at the dam; work to commence about July 1.

CUTBANK, MONT.—The Great Northern railroad plans to spend $2,000,000 for improvements including 30 steel bridges on its line between here and Williston, N. D.

ALAMOGORDO, N. M.—The Alamogordo Light & Power Co. has been incorporated; $25,000; by Col. W. R. Eidson, principal stockholder.

CASHMERE, WASH.—Thomas Bollman, city clerk, will receive bids until May 11 for furnishing and installing a three-stage vertical centrifugal pump and vertical type 35-h. p. motor, electrical switchboard, etc.

OLYMPIA, WASH.—The Tuku Railway & Navigation Co. has been incorporated to construct a railroad from Tuku Inlet to the boundary of British Columbia. Wm. B. Herr, et al., are incorporators.

SPOKANE, WASH.—The Spokane Valley Power Co. will increase its capital stock from $200,000 to $2,000,000 to furnish funds for developing power site. H. S. Willard, Wellston, O., is interested.

WALLA WALLA, WASH.—Walla Walla Self-Oiling Wheel & Bearing Co. has let the contract for a factory to J. A. McLean at $12,000.

WALLA WALLA, WASH.—The Kilkenny Automatic Appliance Co. plans to erect a plant here for the manufacture of an automatic safety device.

GRESHAM, ORE.—The first factory building for the Beaver State Motor Co. has been completed and accepted. A blacksmith shop and power house will be erected immediately. P. A. McComb is president.

BERKELEY, CAL.—The Kawneer Mfg. Co., of Niles, Mich., has purchased a site here and is erecting a 40 x 500-foot class C building. The company manufactures metal architectural specialities.

LOS ANGELES, CAL.—The Pacific Ornamental Iron Works, 1942 South Main street, has given out the information that it will erect a machine shop with about 45,000 square feet of floor space; machinery and appliances for turning out ornamental iron, brass and bronze work will be required.

RICHMOND, CAL.—The Grant Valve & Mfg. Co., recently incorporated with $150,000 capital will erect a plant for the manufacture of valves, castings and plumbers' supplies.

IRON AND STEEL PRICES

Corrected up to Tuesday noon

PIG IRON

(First half delivery.)

Bessemer, valley	$14.00
Bessemer, Pittsburgh	14.90
Basic, Pittsburgh	13.90
Basic, eastern Pa.	14.25
Malleable, Pittsburgh	14.15 to 14.40
Malleable, Chicago	14.25
Malleable, Philadelphia	15.50 to 15.75
Malleable Buffalo	13.50 to 14.00
No. 1X Philadelphia	15.25 to 15.50
No. 2 foundry, Pittsburgh	14.15 to 14.40
No. 2 foundry, Cleveland	14.25
No. 2 foundry, Ironton	13.50
No. 2 foundry, Chicago	14.25
No. 2X foundry, Philadelphia	14.75 to 15.25
No. 2X foundry, New York	14.75 to 15.25
No. 2X foundry, Buffalo	13.50 to 14.00
No. 2 plain, Philadelphia	14.50 to 14.75
No. 2 plain, New York	14.50 to 14.75
No. 2 plain, Buffalo	13.75
No. 2 southern, Birmingham	10.50 to 11.00
No. 2 southern, Cincinnati	13.75 to 14.25
No. 2 southern, Chicago	14.85 to 15.85
No. 2 southern, Philadelphia	14.75 to 15.00
No. 2 southern, Cleveland	14.85 to 15.35
No. 2 southern, New York	14.75 to 15.25
No. 2 southern, St. Louis	14.50 to 15.00
Virginia, 2X, Philadelphia	15.30 to 15.55
Virginia, 2X, Jersey City	15.60 to 15.85
Virginia 2X, New Eng., all rail	16.20 to 16.70
Gray forge (eastern Pa.)	13.90 to 14.25
Gray forge, Pittsburgh	13.65 to 13.90
Gray forge, Birmingham	9.50 to 10.00
Silveries, 5 per cent, Cleveland	17.30 to 17.55
Silveries, 5 per cent, Birmingham	12.50
Silveries, 5 per cent, Chicago	16.85
Silveries, 8 per cent furnace	15.75 to 16.00
Standard low phos., Phila.	21.00
Lebanon low phos., furnace	17.00 to 17.50
Charcoal, Lake Superior, Chgo., Nos. 1 to 4	15.75 to 16.50
Charcoal, Buffalo	16.00 to 17.00
Charcoal, Birmingham	25.00
Middlesbrough, No. 3, Phila., ex ship	15.00 to 15.25

IRON ORE

(Lower lake ports.)

Old range Bessemer, 55 per cent	$4.40
Mesabi Bessemer, 55 per cent	4.15
Old range, non-Bes., 51½ per cent	3.60
Mesabi, non-Bessemer, 51½ per cent	3.40

(Per unit Philadelphia.)

Foreign Bess., 50 to 65 per cent	7 to 8c
Foreign non-Bess., 50 to 65 per cent.	7 to 8c

COKE

(At the ovens.)

Connellsville furnace	$1.90
Connellsville fur. contr.	2.00
Connellsville foundry	2.40 to 2.65
Connellsville fdy., contr.	2.50 to 2.75
Wise county furnace	1.90 to 2.10
Wise county foundry	2.50 to 3.10
Pocahontas furnace	1.90 to 2.40
Pocahontas foundry	2.50 to 2.75
New River, foundry	2.75 to 3.50
New River, furnace	2.40 to 2.75

FERRO-ALLOYS

Ferro-manganese, Baltimore	$38.00 to 39.00
Ferro-silicon, 50 per cent, Pbgh.	71.00 to 73.00
Ferro-silicon, 50 per cent, Phila.	71.00 to 73.00
Ferro-sil., 12 to 13 per cent, Pgh.	22.90
Ferro-sil., 11 to 12 per cent, Pgh.	21.90
Ferro-sil., 10 to 11 per cent, Pgh.	20.90
Ferro-sil., 9 to 10 per cent, Pgh.	19.90
Ferro-carbon titanium, carloads, per lb.	8c to 12½c

SEMI-FINISHED STEEL

Bes. billets, Pbgh. and Yn.	$20.00 to 21.00
Open-hearth bl., Pbgh. and Yn.	20.00 to 21.00
Open-hearth bil., Phila.	23.40
Bes. sheet bars, Pbgh. and Yn.	21.00 to 22.00
Op.-h'th sh. bars, Pbgh. & Yn.	21.00 to 22.00
Forging billets, Phila.	27.40 to 28.40
Forging billets, Pittsburgh	25.00 to 26.00
Wire rods, Pittsburgh	26.00 to 26.50

RAILS AND TRACK MATERIAL

Stand. Bess., rails, Pbgh.	1.25c
Stand. open-hearth rails, Pbgh.	1.34c
Light rails, 8 lbs., Pbgh. or Chi.	1.40c
Lgt. rails, 12 lbs., Pbgh. or Chgo.	1.35c
Lgt. rails, 16 to 20 lb., Pbgh. or Chicago	1.30c
Lgt. rails, 25 to 45 lbs., Pbgh. or Chicago	1.25c
Relaying rails, standard, Chgo.	23.00 to 24.00
Relaying rails, light, Chicago	$21.50 to 22.50
Angle bars, st. sect. Pbgh., base	1.50c
Angle bars, st., sections, Chgo.	1.50c
Spikes, railroad, Pbgh.	1.45c
Spikes, railroad, Chgo.	1.55c
Track bolts, Pbgh.	2.00c
Track bolts, Chgo.	2.00c

SHAPES, PLATES AND BARS

Structural shapes, Pittsburgh	1.15c to 1.20c
Structural shapes, Chicago	1.33c to 1.38c
Structural shapes, Philadelphia	1.30c to 1.35c
Structural shapes, New York	1.31c to 1.36c
Structural shapes, San Francisco	2.00c to 2.05c
Tank plates, Chicago	1.30c to 1.35c
Tank plates, Pittsburgh	1.15c
Tank plates, Philadelphia	1.30c to 1.35c
Tank plates, New York	1.31c to 1.36c
Bars, soft steel, Pittsburgh	1.15c to 1.20c
Bars, soft steel, Chicago	1.33c to 1.38c
Bars, soft steel, Philadelphia	1.30c to 1.35c
Bars, soft steel, New York	1.31c to 1.36c
Hoops, carloads, Pittsburgh	1.25c to 1.30c

Freight Rates, Finished Material

From Pittsburgh, carloads, per 100 pounds, to:—

New York	16 cents
Philadelphia	15 cents
Boston	18 cents
Buffalo	11 cents
Baltimore	14½ cents
Cleveland	10 cents
Cincinnati	15 cents
Chicago	18 cents
Minneapolis and St. Paul	32 cents
Denver	67½ cents
St. Louis	22½ cents
New Orleans	30 cents
Birmingham	45 cents
Pacific coast, plates and shapes	80 cents

Hoops, less carloads, Pittsburgh	1.35c
Bands, Pittsburgh	1.15c to 1.20c
Shafting, carloads, Pbgh., disc.	63 to 65
Shaft'g, less carl'ds, Pbgh., disc	58 to 60
Bar iron, Chicago	1.12½c to 1.15c
Bar iron, Philadelphia	1.20c to 1.25c
Bar iron, New York	1.25c to 1.30c
Bar iron, Cleveland	1.20c to 1.25c
Bar iron, Pittsburgh	1.30c
Hard steel bars, Chicago	1.25c to 1.30c
Smooth finish'g mchy. steel, Chi.	1.68c

SHEETS AND TIN PLATE

No. 28, black, Pittsburgh	1.90c to 2.00c
No. 28 black, Chicago	2.03c to 2.08c
No. 28, tin mill, black, Pbgh.	1.85c to 1.95c
No. 28, galvanized, Pbgh.	2.90c to 3.00c
No. 28, galvanized, Chgo.	3.03c to 3.08c
No. 28, cor. galv., Pbgh.	3.00c to 3.10c
No. 28, painted cor., Pbgh.	2.10c to 2.20c
No. 10, blue annealed, Pbgh.	1.40c to 1.45c
No. 10, blue annealed, Phila.	1.55c to 1.60c
Tin plate, 100 lb., coke, base	$3.40

IRON AND STEEL PIPE

(Pittsburgh.)

	Black Butt-weld.	Galv.
Steel, ¾ to 3 inches	80	71½
Iron, ¼ to 2½ inches	70	61
	Lap-weld.	
Steel, 2½ to 6 inches	79	70½

BOILER TUBES

Steel, 3½ to 4½ inches	71
Iron, 3½ to 4½ inches	60

WIRE PRODUCTS

Wire nails, jobbers, Pittsburgh	$1.60
Wire nails, retailers, Pittsburgh	1.65
Plain wire, jobbers, Pittsburgh	1.40
Plain wire, retailers, Pittsburgh	1.45
Galvanized wire, jobbers, Pbgh.	1.80
Galvanized wire, retailers, Pbgh.	1.85
Polished staples, Pbgh.	1.60
Galvanized staples, Pbgh.	2.00
Barb wire, painted, jobbers, Pbgh.	1.60
Barb wire, painted, retailers, Pbgh.	1.65
Barb wire, galv., retailers, Pbgh.	2.05
Barb wire, galv., jobbers, Pbgh.	2.00

BOLTS AND NUTS

(Delivered within 20-cent freight radius.)

Carriage bolts, ⅜ x 6 inches, smaller and shorter, rolled threads, 80 and 2½; cut threads, 75 and 17½; larger and longer, 70 and 15.

Machine bolts and hot pressed nuts ⅜ x 4 inches, smaller and shorter, rolled, 80 and 7½; cut, 80 and 2½; larger and longer, 70, 10 and 10.

Gimlet and cone point lag or coach screws, 80 and 20.

Hot pressed square, blank and tapped nuts, $6.00 off list; hot pressed hexagon blank or tapped, $6.70.

Cold pressed, C. & T. square, blank, or tapped, $3.80 off; hexagon, blank or tapped, ⅝ inch and larger, $6.80; ½-inch and smaller, $7.40.

RIVETS

Structural rivets, Pbgh.	1.60c to 1.65c
Structural rivets, Chgo.	1.73c to 1.78c
Boiler rivets, Pbgh.	1.70c to 1.75c
Boiler rivets, Chgo.	1.83c to 1.88c

SCREWS

(New York.)

Lag, gimlet and cone point	80 and 20
Coach, gimlet point	80
Standard jack	70 and 10
Mch., cut thread, flat head	50 and 10
Mach., cut thread, round head	50 and 10 and 10
Mch., cut thread, fillister hd.	40 and 40 and 10
Mch., rolled thread, flat head or round head	80 and 10
Set screws, iron	75 and 10 and 10
Set screws, steel, per cent advance over iron	25
Square head cap screws	70 and 10 and 10
Hexagon head cap screws	70 and 10 and 10
Fillister head cap screws	60 and 10 and 10
Flat head wood screws	10 and 10 and 5
Round head wood screws	10 and 10 and 5

WASHERS

(Discounts, Iron or Steel, to Jobbers, Cleveland.)

⅛-inch	$7.25
⅜-inch	7.00
½-inch	7.00
⅝-inch	7.00
¾-inch	7.00

STEEL SHEET PILING

(Pittsburgh.)

Base sizes	1.55c to 1.60c

TWISTED REINFORCING BARS

(Soft steel, Pittsburgh mill.)

¾-inch and larger	1.25c
⅝-inch	1.30c
½-inch	1.35c
⅜-inch	1.50c
¼-inch	1.75c

IRON AND STEEL PRICES

Corrected up to Tuesday noon

TACKS

(New York.)

	Discount.
American carpet tacks	90 and 20 and 10
American cut tacks	90 and 20 and 10
Railroad tacks	90 and 40
Gimp tacks	90 and 20 and 10
Finishing nails	70

WIRE ROPE

Galvanized, iron and steel	47½ and 2½
Bright, iron and steel	55 and 2½

TRIANGLE REINFORCING MESH

(Per 100 square feet f. o. b. mill, car loads.)

No. 4, plain	$1.00
No. 4, galvanized	1.12
No. 7, plain	.49
No. 7, galvanized	.55
No. 23, plain	1.69
No. 23, galvanized	1.88
No. 26, plain	1.17
No. 26, galvanized	1.30
No. 27, plain	.96
No. 27, galvanized	1.07
No. 31, plain	2.49
No. 31, galvanized	2.76
No. 35, plain	1.17c
No. 35, galvanized	1.30
No. 39, plain	3.05
No. 39, galvanized	3.38
No. 43, plain	1.10
No. 43, galvanized	1.23

SPIRAL RIVETED PIPE

(Per 100 linear feet, f. o. b. factory.)

4-inch, plain	$ 19.76
4-inch, galvanized	30.74
6-inch, plain	33.05
6-inch, galvanized	49.73
8-inch, plain	43.17
8-inch, galvanized	65.00
10-inch, plain	66.42
10-inch, galvanized	96.15
12-inch, plain	83.75
12-inch, galvanized	118.30
14-inch, plain	99.14
14-inch, galvanized	138.85
16-inch, plain	117.53
16-inch, galvanized	166.58
20-inch, plain	183.79
20-inch, galvanized	248.39
24-inch, plain	219.92
24-inch, galvanized	293.99
30-inch, plain	324.81
30-inch, galvanized	430.64

CAST IRON PIPE

Three to 24 in., Cleveland	$22.35 to 22.80
Four-inch, water, Chicago	26.50
Six to 12 inches, Chicago	24.50
Larger sizes, Chicago	24.00
Six inch, water, New York	21.25 to 22.50
Four-inch, water, Birmingham	21.50
Six inch and larger, Birmingham	19.50

Gas pipe, $1 per ton higher than water.

WAREHOUSE PRICES

Steel bars, Chicago	1.65c
Steel bars, Cleveland	1.80c
Steel bars, Cincinnati	1.70c to 1.85c
Steel bars, Philadelphia	1.75c to 1.80c
Steel bars, New York	1.90c
Iron bars, Chicago	1.65c
Iron bars, Cleveland	1.75c
Iron bars, Cincinnati	1.65c to 1.75c
Iron bars, Philadelphia	1.65c to 1.70c
Hoops, Chicago	2.15c
Shapes and plates, Chicago	1.75c
Shapes and plates, Cleveland	1.90c
Shapes and plates, Cincinnati	1.80c to 1.90c
Shapes and plates, Philadelphia	1.75c to 1.80c
Shapes and plates, New York	1.95c
No. 10 blue ann. sheets, Chgo.	1.95c
No. 10 blue ann. sheets, Cleve.	2.15c
No. 10 blue ann. sheets, Cinci.	1.95c to 2.05c
No. 28 black sheets, Chgo.	2.55c
No. 28 black sheets, Cleveland.	2.60c
No. 28 black sheets, Cincinnati.	2.45c to 2.55c
No. 28 galv. sheets, Chgo.	3.60c
No. 28 galv. sheets, Cleveland.	3.60c
No. 28 galv. sheets, Cincinnati.	3.45c to 3.55c

IRON AND STEEL SCRAP

(Net tons.)

No. 1 railroad wrought, Chgo.	$ 8.50 to 9.00
No. 1 railroad wrought, Cleve.	9.50 to 10.00
No. 1 R. R. wght., eastern Pa.	14.00 to 14.50
No. 1 railroad wrought, St. L.	7.75 to 8.00
No. 1 railroad wrought, Cinci.	8.50 to 9.00
No. 2 railroad wrought, Chgo.	8.25 to 8.50
No. 2 railroad wrought, St. L.	7.50 to 7.75
Arch bars and transoms, Chgo.	12.00 to 12.50
Arch bars and transoms, St. L.	11.00 to 11.50
Knuckles, coup. and spr'gs, Chgo.	9.00 to 9.50
Knuckles, coup., and sp'gs, St. L.	9.00 to 9.25
Shafting, Chicago	11.50 to 12.00
Shafting, St. Louis	13.00 to 13.50
Steel car axles, Chgo.	12.25 to 12.75
Steel car axles, St. Louis	11.50 to 11.75
Locomotive tires, Chicago	10.00 to 10.50
Locomotive tires, St. Louis	9.00 to 9.50
Cut forge, Chicago	8.00 to 8.50
Pipes and flues, Chicago	6.75 to 7.25
Pipes and flues, Cleveland	8.00 to 8.50
Pipes and flues, St. Louis	6.50 to 7.00
No. 1 cast, Chicago	9.75 to 10.25
No. 1 cast, Cleveland	10.75 to 11.00

Freight Rates, Coke

Connellsville regions, per 2,000 lbs., to:—

Baltimore	$1.80
Buffalo	1.85
Chicago	2.50
Cleveland	1.60
Detroit	2.10
East St. Louis	2.80
Joliet	2.50
Louisville	2.50
Milwaukee	2.70
New York	2.85
Philadelphia	2.05
Pittsburgh	.75
Richmond, Va.	2.94
Toledo	1.85
Valley furnaces	1.20
Cincinnati	2.00

No. 1 cast, Cincinnati	10.00 to 10.50
No. 1 cast, St. Louis	10.00 to 10.50
No. 1 busheling, Chicago	7.50 to 8.00
No. 1 busheling, Cleveland	8.50 to 9.00
No. 1 busheling, Cincinnati	6.25 to 6.75
No. 1 busheling, St. Louis	7.50 to 8.00
No. 2 busheling, Chicago	6.00 to 6.50
No. 1 boiler plate, cut, Chgo.	6.50 to 7.00
No. 1 boiler plate, cut, Buffalo	9.00 to 9.50
No. 1 boiler plate, cut, St. L.	6.00 to 6.50
Boiler punchings, Chicago	9.75 to 10.25
Cast borings, Chicago	4.50 to 5.00
Cast borings, Cleveland	6.00 to 6.50
Cast borings, Cincinnati	4.25 to 4.75
Cast borings, St. Louis	4.00 to 4.50
Machine, shop turnings, Chgo.	5.25 to 5.75
Machine shop turnings, Cleve.	5.50 to 6.00
Machine shop turnings, Cinci.	4.50 to 5.00
Machine shop turnings, St. L.	4.50 to 5.00
Malleable, agricultural, Chgo.	8.50 to 9.00
Malleable, agricultural, St. Louis	7.25 to 7.50
Malleable, railroad, Chicago	9.75 to 10.25
Malleable, railroad, Cincinnati	6.50 to 7.00
Malleable, railroad, St. Louis	8.00 to 8.25
Angle bars, iron, Chgo.	11.75 to 12.25
Angle bars, iron, St. Louis	10.00 to 10.50
Angle bars, steel, Chgo.	8.25 to 8.75
Angle bars, steel, St. Louis	9.00 to 9.50
Stove plate, Chicago	9.25 to 9.75
Stove plate, Cleveland	8.25 to 8.75
Stove plate, Buffalo	9.75 to 10.00
Stove plate, Cincinnati	7.00 to 7.50
Stove plate, St. Louis	7.50 to 8.00
Bundled sheet, Cincinnati	4.75 to 5.25
Wrought iron pil'g plates, Clev.	13.00

(Gross Tons.)

Heavy melting steel, Pbgh.	$12.00
Heavy melting steel, Buffalo	10.00 to 10.50
Heavy melting steel, Chicago	10.00 to 10.50
Heavy melting steel, Cleveland	10.00 to 10.75
Heavy melting steel, Cincinnati	9.00 to 9.50
H'vy melting steel, eastern Pa.	11.00
Heavy melting steel, New York	8.50 to 9.00
Heavy melting steel, St. Louis	11.00 to 11.50
Bundled sheet, Buffalo	6.25 to 6.50
Grate bars, Buffalo	9.50 to 10.00
No. 1 railroad wr'ght, east. Pa.	13.00 to 13.50
No. 1 railroad wrought, Pbgh.	11.00 to 11.50
No. 1 R. R. wght., New York	11.00 to 11.50
No. 1 R. R. wrought, Buffalo	11.00 to 11.50
Shafting, New York	12.25 to 12.50
Pipes and flues, New York	8.00 to 8.25
Pipes and flues, eastern Pa.	10.25 to 10.75
Mch. shop turnings, New York	5.75 to 6.00
Machine shop turnings, Buffalo	5.50 to 6.00
Mch. shop turnings, eastern Pa.	7.50 to 8.00
Cast borings, New York	5.50 to 5.75
Cast borings, eastern Pa.	8.00 to 8.50
Cast borings, Buffalo	6.00 to 6.50
Cast borings, Pittsburgh	8.25 to 8.50
Stove plate, New York	7.50 to 7.75
Stove plate, Pittsburgh	9.50 to 9.75
Stove plate, eastern Pa.	8.75 to 9.25
Grate bars, New York	7.25 to 7.50
Shoveling steel, Chicago	9.25 to 9.50
Shoveling steel, St. Louis	9.00 to 9.50
Reroll'g rails, 5 ft. and ov., Pbgh.	13.50 to 14.00
Reroll. rails, 5 ft. and ov., Chgo.	11.25 to 11.75
Reroll. rails, 5 ft. and ov., Cleve.	11.75 to 12.25
Rerolling rails, 5 ft. and over, eastern Pa.	12.25 to 12.75
Reroll. rails, 5 ft. and ov., St. L.	12.00 to 12.50
Steel rails, short, Chicago	10.75 to 11.25
Steel rails, short, Cleveland	13.00 to 13.50
Steel rails, short, eastern Pa.	11.00 to 11.25
Steel rails, short, St. Louis	11.50 to 12.00
Iron rails, Cleveland	13.50 to 14.00
Iron rails, Cincinnati	10.50 to 11.00
Iron rails, eastern Pa.	15.00 to 16.00
Iron rails, St. Louis	12.00 to 12.25
Frogs, switches, guards, Chgo.	9.75 to 10.25
Frogs, switches and g'rds, St. L.	10.25 to 10.50
Car wheels, (iron), Pittsburgh	12.50 to 13.00
Car wheels (steel) Pittsburgh	13.00 to 13.50
Car wheels, Chicago	11.50 to 12.00
Car wheels, eastern Pa.	12.00 to 12.50
Car wheels, Buffalo	12.00 to 12.50
Car wheels, N. J. points	12.50 to 12.75
Car wheels, St. Louis	11.00 to 11.25
Iron axles, Pittsburgh	22.50 to 23.00
Iron axles, Cincinnati	19.00 to 20.00
Iron axles, eastern Pa.	20.00 to 21.00
Iron axles, Buffalo	21.50 to 22.00
Iron axles, Chicago	17.00 to 17.50
Steel car axles, New York	13.00 to 13.25
Steel car axles, Buffalo	15.00 to 15.50
Steel car axles, Cleveland	16.50 to 17.00
Steel car axles, eastern Pa.	15.25 to 15.75
No. 1 busheling, Buffalo	8.50 to 9.00
No. 2 busheling, Buffalo	6.00 to 6.50
Low phosphorus steel, Buffalo	15.00 to 15.50
Low phosphorus steel, Pbgh.	14.00 to 14.25
Low phos. steel, eastern Pa.	14.50 to 15.00
Malleable R. R. Buffalo	10.75 to 11.25
No. 1 forge, eastern Pa.	8.75 to 9.25
No. 1 cast eastern Pa.	13.00 to 13.50
Bundled sheet, Cleveland	6.50 to 7.00
Boiler plate, Cleveland	7.50 to 8.00
Mal., R. R. east. Pa.	9.00 to 9.50
Mall. iron, agricul., Cleveland	9.00 to 9.50
Mall. iron R. R., Cleveland	10.50 to 11.00
Malleable, railroad, Pittsburgh	10.00 to 10.25
No. 1 cast, Pittsburgh	12.00 to 12.25
No. 1 busheling, Pittsburgh	10.00 to 10.25
Mch. shop turnings, Pbgh.	8.00
Bundled sheet, Pittsburgh	8.50 to 8.75
No. 1 heavy cast (N. J. points)	12.00 to 12.50

MISCELLANEOUS SHOP TOOLS

	Discount.
Standard files	80 and 5
Heavy hammers, 3 to 5 lb.	80 and 10
Heavy hammers, over 5 lb.	80 and 5
Gas pliers, 7-inch, per dozen	$2.00
Gas pliers, 12-inch, per dozen	3.50
Cold chisels, per pound	13c to 15c
Wrenches, Alligator, discount	75 and 80
Wrenches, drop forged S.	50 and 10

Exceptional Service!

With a daily capacity of **twenty tons**; with equipment modern in every feature; with a location ideal for shipping purposes, we are prepared to make castings of any size up to 15 tons, giving you exceptional service.

GREY IRON and SEMI STEEL CASTINGS

No matter how difficult your requirements may be, we guarantee you service and satisfaction.

Let us figure on your next specifications.

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Woodmansee & Davidson, Inc.
ENGINEERS
All Kinds of Power Plants
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Gray Iron CASTINGS
UP TO 10 TONS

Our facilities are EXCEPTIONAL—a FOUNDRY 160 x 80 ft.; a GENERAL MACHINE SHOP 400 x 80 ft., in which we can turn out work up to 16 ft. in dia.; and a large PATTERN SHOP complete in every detail.

The Adamson Machine Co.
AKRON, OHIO

Chilled Castings
and
Intricate Molding of all Descriptions.

Our foundry is strictly up-to-date in every respect, with a capacity of 25 tons daily.
We also make castings of

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Let us figure on your next specifications.
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PHOENIX MANUFACTURING CO.
EAU CLAIRE, WISCONSIN
WORKS ON NORTH SIDE

TISCO MANGANESE STEEL CASTINGS
FOR SEVERE SERVICE
Taylor-Wharton Iron & Steel Co.
High Bridge, New Jersey

Electric Steel Castings

(*Continued from page 799*)

primary terminals has, in that case, averaged 1,050 kilowatt hours per 2,000 pounds steel in the ladle.

The furnace has been operated also on a two-heat-per-day and three-heat-per-day basis, when business conditions warranted. The second and third heats, having the advantage of being started off in a hot furnace, are finished in 4½ hours, at a current consumption of 630 to 640 kilowatt hours per ton. Even with the three heats per day, no steel is poured outside of the regular day shift. Two men start the furnace shortly after midnight, and steel is poured at 7:15 a. m., 11:45 a. m., and at 4:30 p. m. The uncertainties attaching to pouring on schedule time are not as great as they are with either open-hearth or crucible furnaces.

Much has been written, especially by electrochemists familiar with direct-current electrolytic apparatus, regarding the undesirable character of the loads taken by arc furnaces. It may, therefore, be well to state that the load curve for the furnace here considered is smoother and of higher power-factor than the load of similar magnitude used in the shops of the Treadwell company, where the products of the steel and iron foundries are machined.

Safety Hints

(*Continued from page 800*)

gerous machine, be sure good footing is provided and never remove guards or safety devices, unless absolutely necessary in order to do the work.

20. Never leave waste or rags where they might ignite or cause fire.

21. Grind off overlapping edges of chisels, drifts, punches, set hammers, etc.

22. Never pound or hammer a file.

23. Form careful habits and cultivate a thoughtful and deliberate frame of mind when about your work.

24. An orderly exit of employes at noon and end of the day is important, especially when it is necessary to descend staircases.

25. The wearing of long coats by workmen will be discouraged. Aprons not ragged and fastened with strings that will not break easily under strain are better.

26. Never attempt to stop a machine by grabbing the belt.

27. When replacing a belt, stop a machine dead or reduce speed less than one-half.

28. In replacing belts, adjust them on the driven pulley first.

29. When handling a belt between two overhead pulleys, never place the ladder between the shafts nor rest it against a revolving shaft.

30. Do not be ashamed to shift belts with a stick instead of the hand, and for overhead work, always use a stick reaching nearly to the floor.

31. If you will shift a belt by hand, use the palm with thumb and fingers extended and look out for metal splicings.

32. Do not remove or tighten oiler nut by the power of the machine or without oiler being touched at outer end.

33. Do not wipe chips from revolving cutter with the fingers on a steel scale. Use a brush on the off side and with care.

34. Never reach across the revolving oiler to regulate the oil feed.

35. Be sure stops are set and that everything will run clear during the entire cut before throwing in feeds.

36. Never leave a machine with the automatic feed on.
37. Shut off power before throwing in back gears.
38. It is dangerous to wear finger rings while at work, especially those engaged in handling boxes, working on drill presses and milling machines.
39. Do not step on or off the elevator while it is in motion.
40. Don't obstruct fire doors.
41. Don't pour gasoline into the cuspidors.
42. Don't put rags, waste, paper or wood on the heating system.
43. Be careful about lighted and unlighted matches.
44. Hang up oil-soaked clothing so that air will get to them.
45. Don't clean machinery with gasoline.
46. Don't play with fire-fighting apparatus.
47. Put all oil-soaked rags in waste can. That's the right place for them.
48. Have at least the courtesy not to smoke during gymnastic exhibitions in the gym. It's bad practice.
49. Do not attach fans to the spindles of dull presses, milling machines or other tools.
50. An efficient workman thinks before he acts. Are you efficient?

Development of Turbines

At the fourth regular monthly meeting of the Pittsburgh section of the Association of Iron and Steel Electrical Engineers, held April 4, an illustrated talk on "High, Low and Mixed Pressure Turbines" was given by Francis Hodgkinson, chief engineer of the Westinghouse Machine Co.

The theoretical merit and development of the different types of turbines was gone into thoroughly, Mr. Hodgkinson using lantern slides and blackboard to make his points clear. The development of the turbine was interestingly described from the 2,000-kilowatt capacity turbines of 1900 to the 30,000-kilowatt sizes of today. The reduction of steam consumption from 18 pounds to 12 pounds, and of investment charges from $120 to $60 per kilowatt were pointed out.

The early uses of the regenerator in connection with low pressure turbines was touched upon, and it was related that when regenerators were first used, a period of several minutes was strived for. The present-day practice is to install regenerative capacity for 30 to 40 second periods. In places where conditions are favorable, the possibility of allowing the boilers to blow off into the low pressure system instead of through safety valves, was suggested, the protective features of the safety valve being maintained in addition.

Mr. Hodgkinson brought out that turbine blading troubles are not caused by collision or rubbing of the blades, but rather by vibration from the steam current, and that the more substantial the blading is made, the more disastrous will be the effects from collision or rubbing.

A recent report of the United States Geological Survey shows that there are gas wells with production as high as 4,250,000 cubic feet a day near Fort Smith, Ark., and that there are other wells with smaller production in neighboring area, near Mansfield, Ark., and Poteau, Okla. The geologic anticlines and synclines of this region are easily recognized from surface exposures of the rocks, and the finding of the gas in the crests of the anticlines indicates that they control, in large measure at least, the locations of the gas accumulations. Oil has not been found in these fields, but areas of similar structure farther west are locally oil-bearing.

Intelligent—Satisfactory Copy Service

February 21, 1914

The Iron Trade Review
Cleveland, Ohio

Gentlemen:

I enclose herewith O. K'd the suggestion sent with your letter of the 13th.

I wish to compliment you on the class of copy you are turning out for us. It is fine.

If all publications in which we are advertising would turn out as good copy as you do, not only we, but all advertisers would be better off.

If at any time a prospective advertiser should want to know something about your service in handling the copy, just tell them to send me a line, and I will give them my views of your copy.

Under separate cover I am sending you two cuts which you will use in several one page ads on our Shears.

If your page stuff is as good as the quarter page you have gotten up for me in the past, I will expect to have something pretty fine.

Yours respectfully,

JOHN R. POYSER,
Advertising Manager for
The Canton Foundry & Machine Co.
Canton, Ohio

The above letter indicates the kind of *Copy Service Co-Operation* THE IRON TRADE REVIEW gives its advertisers through its efficient *Service Department* maintained for the *free* use of advertisers. Want to know more about it?

THE IRON TRADE REVIEW
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CLEVELAND, OHIO

Opportunities

Men Wanted
Minimum, 50 words, $1.00. Each additional word, 2c. All capitals, 50 words, $1.50. Each additional word, 3c.

Position Wanted
Minimum, 25 words, 50c. Each additional word, 2c. All capitals, 25 words, 75c. Each additional word, 3c.

Miscellaneous Classified
Minimum, 25 words, $1.00. Each additional word, 4c. All capitals, 25 words, $2.00. Each additional word, 8c.

Men Wanted

ENGINEERS, SUPERINTENDENTS, foremen. Designers and Executive Office Men wanted; also cost accountants and experienced engineering salesmen. State fully experience in first letter. The Engineering Agency, Inc., 20th year, Chicago.

HEATER WANTED—MAN THOROUGHly familiar with the heating of large sizes of wrought iron suitable for chain. State experience and wages expected. Address Box 129, THE IRON TRADE REVIEW, Cleveland.

WANTED:—AN UP-TO-DATE CLERK for blast furnace office; experienced in above line and used to handling typewriter. Answer giving references to Box 137, THE IRON TRADE REVIEW, Cleveland, O.

WANTED BY COMPANY OPERATING two merchant blast furnaces, master mechanic of wide blast furnace experience especially as to steam. State age, experience, references, salary desired and when prepared to make engagement. Address Box 144, THE IRON TRADE REVIEW, Cleveland, O.

WANTED AT ONCE. — DESIGNING draftsman, experienced in crane and hoisting machinery. Also first-class structural steel designer. State experience, age, whether married or single, references, salary expected and how soon can report. Good opportunity for right men. Excellent location. Middle west. Address Box 148, THE IRON TRADE REVIEW, Cleveland, O.

WANTED—STEEL FOUNDRY FOREMan for converter foundry in northern Ohio producing 75 tons high quality small steel castings per month. Both green and dry sand. Applicant must be practical molder, temperate and industrious and have ability to produce highest grade castings. Open shop and no labor trouble. State age, experience and salary expected. Address Box 149, THE IRON TRADE REVIEW, Cleveland, O.

IF ACTUALLY QUALIFIED FOR EXecutive, technical, professional, or administrative position between $2,500 and $12,000; communicate confidentially with undersigned counsel. Give name and address only for preliminary details; strictest privacy and safety assured. R. W. Bixby, Lock Box 134-C5, Buffalo.

THE BEST WAY TO GET A GOOD POsition in drafting or engineering is to file an application direct with some of our clients who are depending on us to get competent and experienced applicants for their vacant positions. Send stamp for blank and list of vacant positions. The Cleveland Engineering Agency Co., Rose building, Cleveland, O.

EMPLOYERS DESIRING TO INCREASE efficiency in office, shop or factory, will be able to make known this fact to better advantage by placing a classified ad in THE IRON TRADE REVIEW than through any other means.

Positions Wanted

COST ACCOUNTANT.—TAKE CHARGE of time-keeping, labor distribution, inventories, material costs, proper distribution of overhead, records of efficiency, show leaks and wastes, obtain accurate costs. Address Box 134, THE IRON TRADE REVIEW, Cleveland, O.

AS FOREMAN OF PATTERN SHOP. Over 12 years as foreman employing from 20 to 100 men. Broad experience with molding machines, gas and oil engines, and electrical machinery. Address Box 987, THE IRON TRADE REVIEW, Cleveland, O.

WANTED: — POSITION AS SUPERINtendent or foreman by a thoroughly practical and capable man of 20 years experience in erecting iron stairways, railings, store fronts, and general ornamental iron work. Address Box 108, THE IRON TRADE REVIEW, Cleveland, O.

POSITION WANTED—BLAST FURNACE AND STEEL MILL. MASTER MECHANIC WILL BE OPEN FOR ENGAGEMENT MAY 1. WIDE EXPERIENCE WITH STEAM AND ELECTRIC POWER EQUIPMENTS, CONSTRUCTION AND OPERATION. ADDRESS BOX 132, THE IRON TRADE REVIEW, CLEVELAND, O.

POSITION AS FOREMAN PATTERN maker; sixteen years' experience; over seven years as jobbing shop foreman. If you are looking for a hustler with ability, I invite correspondence. Address Box 140, THE IRON TRADE REVIEW, Cleveland, Ohio.

EXECUTIVE, METALLURGICAL OR operating position with furnace and rolling mill or steel foundry company by young, tireless, competent man, widely and successfully experienced as manager and metallurgist of plants producing two thousand tons monthly, high grade products. Address Box 143, THE IRON TRADE REVIEW, Cleveland, O.

METALLURGICAL ENGINEER, NOW employed as such on large Iron and Steel plant, desires change. Technical graduate, fifteen years' practical experience covering by-products coke, blast furnace, open hearth, electric furnace, sheet, tube, rod, rail and plate mill practice. Good supervisor or technical assistant to General Manager. Prefers opportunity for investigation and development of special processes. Address Box 124, THE IRON TRADE REVIEW, Cleveland, Ohio.

SITUATION WANTED—A COMPETENT man is open for engagement to take charge of boiler-plate or structural shop. Address Boiler Maker, THE IRON TRADE REVIEW, Cleveland, O.

POSITION WANTED BY EXPERIENCED draftsman on rolling mill work and machinery design. Age 36. Address Box 991, THE IRON TRADE REVIEW, Cleveland, O.

WANTED: — POSITION AS FOUNDRY superintendent; competent to take charge of pattern shop; also familiar with every detail connected with the successful operation of a foundry regardless of size; good executive, at present holding responsible position; A-1 references. Address Box 146, THE IRON TRADE REVIEW, Cleveland, O.

A TRAINED BUSINESS MAN OF 35 with ability to analyze, decide, plan, delegate and act; experienced in finance, costs, credits, accounts, sales, purchases, in fact all branches of manufacturing business, wishes, for excellent reasons, to make a change. At present general manager of a corporation, before that secretary and treasurer. Good record, gilt edged references. Address Box 147, THE IRON TRADE REVIEW, Cleveland.

Sales Agents

ENGINEER.—MECHANICAL AND METallurgical—12 years' iron and steel industry, seeks Pittsburgh and vicinity sales agency for foundry, steel mill, supply or machinery products. Can handle the engineering and technical end in the promotion of sales. Address Box 121, THE IRON TRADE REVIEW, Cleveland, O.

MAN WITH BOSTON OFFICE WANTS to represent steel company in New England. Long experience as managar steel warehouse business in Boston. Might also carry stock. Address Box 142, THE IRON TRADE REVIEW, Cleveland, Ohio.

For Sale

FOR SALE—170 ACRE COUNTRY EState on Lake Erie, 2,250 feet of lake front, on car line; gas well, water system, electric lights, unusually well equipped farm; fine buildings and soil; stock, tools and crops go with property. Harry R. Scobie, 405 Swetland building, Cleveland, O.

OLD ESTABLISHED FOUNDRY, Pittsburgh District, within 30 miles, on three lines of railroads. Fully equipped, having pattern making and machine shop in connection with 43,000 square feet of buildings and 50,000 square feet of yard space; business in full operation, capitalized at $100,000, stock fully paid; best railroad facilities with private sidings. Address Alexander & Ohl Co., 7th floor, May Bldg., Fifth and Liberty Aves., Pittsburgh, Pa.

Miscellaneous

ELECTRIC FURNACES DESIGNED and installed for the production of high grade steel castings. Have special proposition. Address Walter L. Morrison, Marine Bank building, Erie, Pa.